

Conseil national de recherches Canada Direction des services administratifs et gestion de l'immobilier

#### REQUEST FOR PROPOSALS DEMANDE DE PROPOSITIONS

## RETURN BIDS TO : RETOURNER LES SOUMISSIONS A:

National Research Council Canada (NRC) Procurement Services 1200 Montreal Road, Building M-22 Ottawa, Ontario K1A 0R6 Bid Fax: (613) 991-3297

#### Instructions: See Herein

#### Proposal To:

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

#### Proposition aux:

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).



| Title/Sujet   |   |  |
|---|---|--|
| siRNA Library Synthesizing Service  |   |  |
| Solicitation No./N. de l'invitation 16-22076  | Date<br>September 27 <sup>th</sup> , 2016 |  |
| Solicitation Closes/L'invitation prend fin<br>at/àat/à14 :00on/leNovember 08 2016   | Time Zone/Fuseau Horaire<br>EDT           |  |
| Address Enquiries To/Adresser demandes de   | renseignements à :                        |  |
| Contracting Officer: Johnathon Gillis<br>Telephone No./N. de téléphone : <b>(613)993-5506</b><br>Email : <u>Johnathon.Gillis@nrc-cnrc.gc.ca</u> |   |  |
|   |   |  |
|   |   |  |

Instructions: Voir aux présentes

| Vendor/Firm Name and Address   |
|--|
| Raison sociale et adresse du fournisseur/de l'entrepreneur                           |
|  |
|  |
|  |
|  |
| Telephone No./N. de telephone  |
| Facsimile No./N. de télécopieur  |
| Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) |
| Nom et titre de la personne autorisé à signer au nom du fournisseur/de               |
| l'entrepreneur (taper ou écrire en caractères d'imprimerie)                          |
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|  |
| Signature Date   |
|  |

# siRNA Library Synthesizing Service

## 1.0 **PRESENTATION OF PROPOSALS**

1.1 You are invited to submit four copies of a Technical Proposal and two copies of a Financial Proposal in two separate envelopes or electronic attachments to fulfil the following requirement forming part of this Request for Proposals. One envelope must be clearly marked 'Technical Proposal' and the other envelope must be marked 'Financial Proposal'. Bidders choosing to submit electronic submissions are to email a technical bid and a financial bid in two separate attachments. All financial information must be fully contained in the Financial Proposal, and only in the Financial Proposal. Vendors who provide financial information in the technical proposal will be disqualified. All proposals should include the front page of this RFP duly completed.

## 2.0 SCOPE OF WORK

2.1 To provide Professional Services for the National Research Council Canada in accordance with the detailed Statement of Work attached as Appendix **"A".** 

# 3.0 **PERIOD OF CONTRACT**

3.1 NRC anticipates that the work will begin 2 weeks after the contract is awarded but will be coordinated with the winning bidder.

### 4.0 **ENQUIRIES**

4.1 If you require clarification regarding any aspect of this RFP, address all queries to the Contracting Authority, identified below, at least 10 working days before the closing date. All queries must be in writing and queries received less than 10 working days prior to the closing date cannot be guaranteed a response. Information received verbally will not be binding upon the NRC.

#### Johnathon Gillis Contracting Authority, Procurement Services National Research Council Canada 1200 Montreal Road, Bldg. M-22 Ottawa, Ontario K1A 0R6 Telephone: (613) 993-5506 Email: Johnathon.Gillis@nrc-cnrc.gc.ca

- 4.2 To ensure the equality of information among Bidders, responses to general enquiries will be made available to all bidders unless such publications would reveal proprietary information. The bidder who initiates the question will not be identified. Technical questions that are considered proprietary by the bidder must be clearly identified. NRC will respond individually to the bidder if it considers the questions proprietary. If NRC does not consider the question proprietary, the bidder submitting it will be allowed to withdraw the question, or have the question and answer made available through the Open Bidding System (OBS) to all bidders.
- 4.3 Vendors who attempt to obtain information regarding any aspect of this RFP during the solicitation period through any NRC contacts other than the Contracting Authority identified herein, may be disqualified (for that reason alone).
- 4.4 It is the responsibility of the Bidder to obtain clarification of the requirement contained herein, if necessary, prior to submitting its proposal. The Bidder must have written confirmation from the Contracting Authority for any changes, alterations, etc., concerning this RFP.

#### 5.0 **PROPOSAL CLOSING DATE AND BID SUBMISSION INSTRUCTIONS**

5.1 Proposals <u>must</u> be delivered not later than 2:00 PM EST, November 8<sup>th</sup> 2016, to the following **Contracting Authority**:

#### **Johnathon Gillis**

Contracting Authority, Procurement Services National Research Council Canada 1200 Montreal Road, Bldg. M-22 Ottawa, Ontario K1A 0R6 Telephone: (613) 993-5506 Email: Johnathon.Gillis@nrc-cnrc.gc.ca

### Proposals must not be sent directly to the Project Authority

- 5.2 Proposals <u>must</u> be delivered in a sealed envelope and the Bidder's name and the RFP No. should be clearly indicated on the Proposal Envelope. It is the vendor's responsibility to obtain date and time stamped receipt signed by the receptionist as proof that NRC has received their proposal within the prescribed time limit. All risks and consequences of incorrect delivery of bids are the responsibility of the Bidder.
- 5.3 NRC will accept proposal documents by electronic mail or on diskette. Electronic Submissions maybe directed to the Contracting Authority via email: <u>Johnathon.Gillis@nrc-cnrc.gc.ca</u> before closing date.

- 5.4 Proposals received after the closing date will not be considered and will be returned to the sender. The sender has the sole responsibility for the timely dispatch and delivery of a proposal and cannot transfer such responsibility to the NRC. No supplementary information will be accepted after the closing deadline unless NRC requests a clarification.
- 5.5 All submitted proposals become the property NRC and will not be returned to the originator.

## 6.0 **EVALUATION CRITERIA**

6.1 Bidders must comply with all of the mandatory requirements listed in the detailed statement of requirement (Appendix A) to be considered technically compliant. Bidders are to provide a detailed response to each criterion. NRC reserves the right to verify any and all information provided by the bidder in his/her proposal.

### 7.0 COST PROPOSAL

- 7.1 The cost proposal must be a **fixed price quotation**, **FOB Destination**, **excluding GST/HST**. The fixed price must include all the materials and services required to fulfil all aspects of the Statement of Work. Bidders should identify the currency on which the cost proposal is based.
- 7.2 The siRNA library must target a customizable list of 3,926 Human genes.
- 7.3 The cost proposal must have sufficient structure to show how the total proposed cost was calculated. It should contain the following elements:
  - a) The number, classification and per diem and/or hourly rate for all assigned personnel. For each classification, the number of workdays should be defined.
  - b) The amount and explanation for other miscellaneous expenses that could be incurred.
- 7.4 GOODS AND SERVICES TAX (GST) and HARMONIZED SALES TAX (HST): The GST and HST, whichever is applicable, shall be considered an applicable tax for the purposes of this RFP and extra to the price herein. The amount of GST or HST shall be disclosed and shown as a separate item.
- 7.5 Bids will be evaluated in Canadian currency, therefore, for evaluation purposes, the exchange rate quoted by the Bank of Canada as being in effect on date of bid closing, shall be applied as the conversion factor for foreign currency. Prices quoted shall not be subject to, or conditional upon,

fluctuations in commercial or other interest rates during either the evaluation or contract period.

# 8.0 LEVEL OF EFFORT

8.1 The funding available to support this work is limited to a maximum of \$90,000.00 CDN excluding taxes, whichever is applicable. **Proposals** exceeding this cost will not be considered.

### 9.0 CONDITIONS OF SUBMISSION

- 9.1 There shall be no payment by the National Research Council for costs incurred in the preparation and submission of proposals in response to this request. No payment shall be made for costs incurred for clarification(s) and/or demonstration(s) that may be required by NRC. The National Research Council reserves the right to reject any or all proposals submitted, or to accept any proposal in whole or in part without negotiation. A contract will not necessarily be issued as a result of this competition. NRC reserves the right to amend, cancel or reissue this requirement at any time.
- 9.2 Proposals submitted must be valid for not less than sixty (60) calendar days from the closing date of the RFP.
- 9.3 Your proposal should contain the following statement:

"We hereby certify that the price quote is not in excess of the lowest price charged anyone else, including our most favoured customer, for like services".

9.4 Any contract resulting from this invitation will be subject to the **General Conditions - Services 2035 (copy attached as Appendix "C")** and any other special conditions that may apply.

# 10.0 Method Of Selection:

10.1 The Method of Selection will be the bidder that is **technically compliant** and addresses all of the mandatory requirements in the statement of work, which has the **lowest price** within **NRC stipulated budget**, will be selected for this contract.

### 11.0 **CONFIDENTIALITY**

11.0 This document is UNCLASSIFIED, however; the contractor shall treat as confidential, during as well as after the services contracted for, any information of the affairs of NRC of a confidential nature to which its servants or agents become privy.

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## 12.0 CRIMINAL CODE OF CANADA

12.1 Canada may reject an offer where the Bidder, or any employee or subcontractor included as part of the offer, has been convicted under section 121 ("Frauds on the government" & Contractor subscribing to election fund"), 124 ("Selling or purchasing office"), or 418 ("Selling defective stores to Her Majesty") of the Criminal Code.

### 13.0 **DEBRIEFINGS**

13.1 After contract award, bidders may request a debriefing on the results of the bid solicitation. Bidders should make the request to the Contracting Authority within 15 working days of receipt of notification that their bid was unsuccessful. The debriefing may be provided in writing, by telephone or in person.

## 14.0 **GOVERNMENT SMOKING POLICY**

14.1 Where the performance of the work requires the presence of the Contractor's personnel on government premises, the Contractor shall ensure that its personnel shall comply with the policy of the Government of Canada, which prohibits smoking on any government premises.

### 15.0 ACCESS TO GOVERNMENT FACILITIES / EQUIPMENT

- 15.1 Access to the facilities and equipment necessary to the performance of the work shall be provided through arrangements to be made by the Project Authority named herein. There will be however; no day-to-day supervision of the Contractor's activities nor control of the Contractor's hours of work by the Project Authority.
- 15.2 The Contractor undertakes and agrees to comply with all Standing Orders and Regulations in force on the site where the work is to be performed, relating to the safety of persons on the site or the protection of property against loss or damage from any and all causes including fires.

# 16.0 **GENERAL CONDITIONS**

16.1 The General Conditions 2035 entitled General Conditions Services and attached as Appendix **"C"** form part of this Contract.

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# 17.0 **PROGRESS REPORT**

17.1 As part of and together with each progress claim, the Contractor must submit a progress report consisting of a narrative of approximately one (1) page describing the technical progress achieved in terms of the "Statement of Work", explaining any variations in the work or expenditure plan, specifying any problems encountered or foreseen (relating to time, cost or technical matters) and any other matter considered reportable by the Contractor.

# 18.0 NON-PERMANENT RESIDENT (FOREIGN COMPANY)

18.1 The Contractor shall ensure that non-permanent residents intending to work in Canada on a temporary basis in fulfilment of the Contract, who are neither Canadian citizens nor United States nationals, receive all appropriate documents and instructions relating to Canadian immigration requirements and secure all required employment authorizations prior to their arrival at the Canadian port of entry. The Contractor shall ensure that United States nationals having such intentions receive all appropriate documents and instructions in that regard prior to their arrival at the Canadian port of entry. Such documents may be obtained at the Canadian port of entry. The Contractor's country. The Contractor shall be responsible for all costs incurred as a result of non-compliance with immigration requirements.

### 19.0 NON-PERMANENT RESIDENT (CANADIAN COMPANY)

19.1 The Contractor is responsible for compliance with the immigration requirements applicable to non-permanent residents entering Canada to work on a temporary basis in fulfillment of the Contract. In some instances, the employment authorization necessary to enter Canada cannot be issued without prior approval of Human Resources Centre Canada (HRCC). HRCC should always be contacted as soon as the decision to bring in a non-permanent resident is made. The Contractor will be responsible for all costs incurred as a result of non-compliance with immigration requirements.

## 20.0 LUMP SUM PAYMENT - WORK FORCE REDUCTION PROGRAMS

- 21.1 It is a term of the contract that:
  - a. the Contractor has declared to the Departmental Representative whether the Contractor has received a lump sum payment made pursuant to any work force reduction program, including but not limited to the Work Force Adjustment Directive, the Early Departure Incentive Program, the Early Retirement Incentive Program or the Executive Employment Transition Program, which has been implemented to reduce the public service;
  - b. the Contractor has informed the Departmental Representative of the terms and conditions of that work force reduction program, pursuant to which the Contractor was made a lump sum payment, including the termination date, the amount of the lump sum payment and the rate of pay on which the lump sum payment was based; and
  - c. the Contractor had informed the Departmental Representative of any exemption in respect of the abatement of a contract fee received by the Contractor under the <u>Early Departure</u>
  - d. <u>Incentive Program Order</u> or paragraph 4 of Policy Notice 1995-8, of July 28, 1995.

### 21.0 FORMER PUBLIC SERVANT

21.1 Contracts with former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, bidders must provide the information required below.

### 21.2 Definitions

For the purposes of this clause,

"former public servant" is any former member of a department as defined in the Financial Administration Act, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

- a) an individual;
- b) an individual who has incorporated;
- c) a partnership made of former public servants; or
- d) a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

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"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"pension" means, a pension or annual allowance paid under the Public Service Superannuation Act (PSSA), R.S., 1985, c.P-36, and any increases paid pursuant to the Supplementary Retirement Benefits Act, R.S., 1985, c.S-24 as it affects the PSSA. It does not include pensions payable pursuant to the Canadian Forces Superannuation Act, R.S., 1985, c.C-17, the Defence Services Pension Continuation Act, 1970, c.D-3, the Royal Canadian Mounted Police Pension Continuation Act , 1970, c.R-10, and the Royal Canadian Mounted Police Superannuation Act, R.S., 1985, c.R-11, the Members of Parliament Retiring Allowances Act , R.S., 1985, c.M-5, and that portion of pension payable to the Canada Pension Plan Act, R.S., 1985, c.C-8.

21.3 Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes** ( ) **No** ( )

If so, the Bidder must provide the following information, for all FPS in receipt of a pension, as applicable:

- a) name of former public servant;
- b) date of termination of employment or retirement from the Public Service.
- 21.4 By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

### 21.5 <u>Work Force Reduction Program</u>

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of a work force reduction program? **Yes**() **No**()

If so, the Bidder must provide the following information:

- a) name of former public servant;
- b) conditions of the lump sum payment incentive;

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- c) date of termination of employment;
- d) amount of lump sum payment;
- e) rate of pay on which lump sum payment is based;
- f) period of lump sum payment including start date, end date and number of weeks;
- g) number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.
- 21.6 For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including the Goods and Services Tax or Harmonized Sales Tax.

# 22.0 OFFICE OF THE PROCUREMENT OMBUDSMAN (OPO)

22.1 The Office of the Procurement Ombudsman (OPO) was established by the Government of Canada to provide an independent avenue for suppliers to raise complaints regarding the award of contracts under \$25,000 for goods and under \$100,000 for services. You have the option of raising issues or concerns regarding the solicitation, or the award resulting from it, with the OPO by contacting them by telephone at 1-866-734-5169 or by e-mail at boa.opo@boa-opo.gc.ca. You can also obtain more information on the OPO services available to you at their website at www.opo-boa.gc.ca.

### 23.0 ATTACHMENTS

Appendix "A" - Detailed Statement of Work Appendix "B" – Gene Pool Sequences Appendix "C" - General Conditions 2035

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#### **APPENDIX A**

#### Statement of Requirement: siRNA Library Construction Service

#### 1.0 Objective:

The National Research Council (NRC) Human Health Therapeutic (HHT) portfolio has developed an antibody production pipeline that aims to target relevant disease genes, mainly implicated in all aspect of cancer. In order to identify these relevant disease genes, the NRC's HHT portfolio is currently building a functional automated high-throughput screening platform, using an arrayed siRNA approach, to identify relevant functional genes that can be targeted with therapeutic antibodies.

Within this mandate, the NRC wishes to purchase a custom-made siRNA library specifically targeting genes encoding both plasma membrane-bound and secreted proteins.

The work consists of synthesizing, supplying, and delivering of a siRNA library at the NRC address; all of the work must be completed by November? 30th, 2016.

#### 2.0 Mandatory technical specifications:

#### The delivered siRNA library must have the following specifications:

2.1. The siRNA library **must** target a customizable list of 3,926 human genes as defined by the NRC.

2.2. Each gene **must** be targeted by a pool of 4 siRNAs.

2.3. Each of the 4 individual siRNA in a pool **must** target a different sequence for each gene.

2.4. Each pool of 4 siRNAs **must** contain 0.25nmol of total siRNA (and not 0.25nmol of each siRNA in the pool for a total of 1nmol).

2.5. Each pool of siRNA targeting a unique gene **must** guarantee a greater than 75% knock-down efficiency of the intended mRNA target under optimal delivery conditions using less than 100nM of siRNA.

2.6. The siRNA library **must** be supplied in a 96-well plate format; each well of the plate containing a pool of 4 siRNAs targeting a single gene.

2.7. Each siRNA in each pool must be chemically modified on the first and second 5' nucleotide of the sense strand with a 2'-O-alkyl modification to limit entry into the RISC complex.

2.8 Each siRNA in each pool **must** be phosphorylated on the first 5' nucleotide and modified with 2'-O-alkyl on the second 5' nucleotide of the antisense strand.

2.9. Sequence of each siRNA in the pool for each gene must be provided following purchasing.

### 3.0 Deliverables:

3.1 Sequences of each siRNA in the pool for each gene must be provided. See table for information (Appendix B)

## 4.0 Delivery and Installation

The siRNA library must be delivered at 6100, Royalmount Avenue, Montréal, Québec, H4P 2R2

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| <u>Gene</u><br>Symbol |
|-----------------------|
| A1BG                  |
| A2M                   |
| A2ML1                 |
| ABCA1                 |
| ABCA12                |
| ABCA2                 |
| ABCA3                 |
| ABCA7                 |
| ABCB1                 |
| ABCB4                 |
| ABCB6                 |
| ABCB8                 |
| ABCC1                 |
| ABCC10                |
| ABCC2                 |
| ABCC3                 |
| ABCC4                 |
| ABCC5                 |
| ABCC6                 |
| ABCC9                 |
| ABCD4                 |
| ABCG1                 |
| ABCG2                 |
| ABCG4                 |
| ABHD12                |
| ABHD13                |
| ABHD14A               |
| ABHD15<br>ABHD17A     |
| ABHD17A<br>ABHD17B    |
| ABHD178<br>ABHD18     |
| ABO                   |
| ACAN                  |
| ACE                   |
|                       |

# Appendix B – Gene to be Targeted by the pooled siRNA

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| ACE2             |
|------------------|
| ACKR2            |
| ACKR3            |
| ACKR4            |
| ACP7             |
| ACPP             |
| ACRBP            |
| ACRV1            |
| ACVR1            |
| ACVR1B           |
| ACVR1C           |
| ACVR2A           |
| ACVR2B           |
| ACVRL1           |
| ADA              |
| ADAM10           |
| ADAM11           |
| ADAM12           |
| ADAM15           |
| ADAM17           |
| ADAM18           |
| ADAM19           |
| ADAM15           |
| ADAM20           |
| ADAM21           |
| ADAM22           |
| ADAM23           |
| ADAM23           |
| ADAM20           |
| ADAM29           |
| ADAM30<br>ADAM32 |
| ADAM32<br>ADAM33 |
|                  |
| ADAM7            |
| ADAM8            |
| ADAM9            |
| ADAMDEC1         |
| ADAMTS1          |
| ADAMTS10         |
| ADAMTS12         |
| ADAMTS13         |
| ADAMTS14         |
| ADAMTS15         |

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ADAMTS16 ADAMTS17 ADAMTS18 ADAMTS19 ADAMTS2 ADAMTS20 ADAMTS3 ADAMTS4 ADAMTS5 ADAMTS6 ADAMTS7 ADAMTS9 ADAMTSL1 ADAMTSL2 ADAMTSL3 ADAMTSL5 ADCK1 ADCK2 ADCY1 ADCY2 ADCY3 ADCY4 ADCY5 ADCY6 ADCY7 ADCY9 ADCYAP1 ADCYAP1R1 ADGRA1 ADGRA2 ADGRA3 ADGRB2 ADGRB3 ADGRD1 ADGRD2 ADGRE1 ADGRE2 ADGRE5 ADGRF1 ADGRF2 ADGRF3 ADGRF4

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ADGRF5 ADGRG1 ADGRG2 ADGRG3 ADGRG5 ADGRG6 ADGRG7 ADGRL1 ADGRL2 ADGRL3 ADGRL4 ADGRV1 ADIPOR1 ADIPOR2 ADM ADM2 ADM5 ADORA1 ADORA2A ADORA2B ADORA3 ADPGK ADRA1A ADRA1D ADRA2A ADRA2B ADRA2C ADRB1 ADRB2 ADRB3 ADTRP AEBP1 AFP AGA AGER AGGF1 AGR2 AGR3 AGRN AGT AGTR1 AIG1

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AIMP1 AJAP1 AKR1B10 ALCAM ALG10B ALK ALPL AMH AMHR2 AMIG01 AMIGO2 AMIGO3 AMN AMTN ANG ANGPT1 ANGPT2 ANGPTL2 ANGPTL4 ANGPTL8 ANKAR ANKH ANO1 ANO10 ANO4 ANO6 ANO7 ANO8 ANO9 ANOS1 ANPEP ANTXR1 ANTXR2 ANXA13 ANXA2 AOAH AOC1 AOC2 APCDD1 APCDD1L APH1B APLN

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APLNR APLP1 APLP2 APMAP APOA1BP APOC1 APOC2 APOE APOL1 APOL4 APOLD1 APOO APP AQP1 AQP11 AQP4 AQP5 AQP6 AQP9 AREG ARG1 ARIH2OS ARSA ARSB ARSD ARSE ARSG ARSI ARSJ ARSK ART4 ARTN ASAH1 ASIC1 ASIC3 ASIC4 ASIP ASPN ASTN2 ATP10D ATP11A ATP11B

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| ATP11C   |
|----------|
| ATP13A3  |
| ATP13A4  |
| ATP13A5  |
| ATP1A1   |
| ATP1B3   |
| ATP2B1   |
| ATP2B2   |
| ATP2B3   |
| ATP2B4   |
| ATP5A1   |
| ATP6AP2  |
| ATP6V0A1 |
| ATP6V0A2 |
| ATP6V0A4 |
| ATP7A    |
| ATP7B    |
| ATP8A1   |
| ATP8A2   |
| ATP8B1   |
| ATP8B2   |
| ATP8B3   |
| ATP8B4   |
| ATP9A    |
| ATRAID   |
| ATRN     |
| AVPR1B   |
| AXL      |
| AZU1     |
| B2M      |
| B4GALT1  |
| B4GALT5  |
| BACE1    |
| BACE2    |
| BAGE     |
| BAGE2    |
| BAGE3    |
| BAGE4    |
| BAGE5    |
| BAMBI    |
| BCAM     |
| BCAN     |
|          |

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| BCAP31 |
|--------|
| BCHE   |
| BDKRB1 |
| BDKRB2 |
| BDNF   |
| BEST1  |
| BEST3  |
| BFAR   |
| BGLAP  |
| BGN    |
| BMP1   |
| BMP2   |
| BMP3   |
| BMP4   |
| BMP5   |
| BMP6   |
| BMP7   |
| BMP8A  |
| BMP8B  |
| BMPER  |
| BMPR1A |
| BMPR1B |
| BMPR2  |
| BOLA1  |
| BOLA3  |
| BPI    |
| BPIFA1 |
| BPIFA2 |
| BPIFA3 |
| BPIFB2 |
| BPIFB4 |
| BPIFC  |
| BRICD5 |
| BRINP2 |
| BRINP3 |
| BSG    |
| BSND   |
| BST2   |
| BTBD17 |
| BTC    |
| BTD    |
| BTLA   |
|        |

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BTN1A1 BTN2A1 BTN2A2 BTN3A1 BTN3A2 BTN3A3 BTNL9 BVES C10orf111 C10orf128 C10orf25 C10orf35 C10orf54 C10orf99 C11orf24 C11orf45 C12orf49 C12orf73 C14orf132 C14orf180 C14orf37 C14orf93 C15orf61 C16orf54 C16orf58 C16orf91 C17orf62 C17orf67 C17orf77 C17orf80 C17orf99 C18orf54 C19orf24 C19orf38 C1orf101 C1orf159 C1orf162 C1orf210 C1orf233 C1orf27 C1orf54 C1orf56

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C1QA C1QB C1QBP C1QC C1QL1 C1QL3 C1QL4 C1QTNF1 C1QTNF2 C1QTNF3 C1QTNF4 C1QTNF5 C1QTNF6 C1QTNF9 C1QTNF9B C1R C1RL C1S C2 C20orf141 C22orf46 C2CD2 C2orf66 C2orf69 C2orf82 C3 C3AR1 C3orf18 C3orf33 C3orf58 C3orf80 C4A C4B C4BPA C4BPB C4orf26 C4orf3 C4orf32 C4orf48 C5 C5AR1 C5AR2

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C5orf15 C5orf28 C5orf38 C5orf42 C5orf46 C5orf64 C6orf1 C6orf120 C6orf15 C9orf47 C9orf57 C9orf91 CA11 CA12 CA14 CA4 CA6 CA9 CABP7 CACFD1 CACHD1 CACNA1A CACNA1B CACNA1C CACNA1D CACNA1E CACNA1F CACNA1G CACNA1H CACNA1I CACNA2D1 CACNA2D2 CACNA2D3 CACNA2D4 CACNG3 CACNG4 CACNG5 CACNG6 CACNG7 CACNG8 CADM1 CADM2

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CADM3 CADM4 CALCB CALCR CALCRL CALHM1 CALHM2 CALHM3 CALR CALU CAMP CANT1 CARTPT CASR CATSPER1 CATSPER2 CATSPER3 CATSPERB CATSPERG CBARP CBLN1 CBLN2 CBLN3 CBLN4 CCDC107 CCDC126 CCDC134 CCDC80 ССК CCKAR CCKBR CCL1 CCL11 CCL13 CCL15 CCL17 CCL18 CCL19 CCL2 CCL20 CCL21 CCL22

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| CCL23        |
|--------------|
| CCL24        |
| CCL26        |
| CCL28        |
| CCL3         |
| CCL3L1       |
| CCL3L3       |
| CCL4         |
| CCL4L1       |
|              |
| CCL4L2       |
| CCL5         |
| CCL7         |
| CCL8         |
| CCR1         |
| CCR10        |
| CCR2         |
| CCR3         |
| CCR4         |
| CCR5         |
| CCR6         |
| CCR7         |
| CCR8         |
| CCR9         |
| CCRL2        |
| CD101        |
| CD109        |
| CD14         |
| CD151        |
| CD163        |
| CD163L1      |
| CD164        |
| CD164L2      |
| CD180        |
| CD19         |
| CD15<br>CD1A |
|              |
| CD1B         |
| CD1C         |
| CD1D         |
| CD1E         |
| CD2          |
| CD200        |
| CD200R1      |

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| CD207<br>CD229<br>CD226<br>CD244<br>CD247<br>CD248<br>CD274<br>CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LB<br>CD300LB<br>CD300LB<br>CD302<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD52<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD51<br>CD       | CD209<br>CD22<br>CD226<br>CD244<br>CD247<br>CD248<br>CD27<br>CD274<br>CD276<br>CD300<br>CD300C<br>CD300C<br>CD300LB<br>CD300LB<br>CD300LB<br>CD302<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD320<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD55<br>CD59<br>CD51   |       |
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| CD247<br>CD274<br>CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300E<br>CD300E<br>CD300LF<br>CD302<br>CD320<br>CD32<br>CD32<br>CD32<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD4<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   | CD247<br>CD248<br>CD27<br>CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300C<br>CD300L<br>CD300L<br>CD302<br>CD32<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD34<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD4  | CD244 |
| CD248<br>CD27<br>CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300L<br>CD300L<br>CD300L<br>CD320<br>CD32<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD4  | CD248<br>CD27<br>CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300L<br>CD300L<br>CD300L<br>CD320<br>CD32<br>CD32<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD4<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   |       |
| CD277<br>CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LB<br>CD300LF<br>CD320<br>CD32<br>CD32<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD4   | CD277<br>CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LB<br>CD300LB<br>CD320<br>CD32<br>CD32<br>CD32<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD4  |       |
| CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LF<br>CD302<br>CD320<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD4  | CD274<br>CD276<br>CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LF<br>CD302<br>CD32<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD32<br>CD36<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   |       |
| CD276<br>CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LB<br>CD300LF<br>CD320<br>CD32<br>CD32<br>CD34<br>CD37<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40  | CD276<br>CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LF<br>CD302<br>CD320<br>CD32<br>CD32<br>CD34<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   |       |
| CD28<br>CD300A<br>CD300E<br>CD300LF<br>CD300LF<br>CD302<br>CD320<br>CD32<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD4  | CD28<br>CD300A<br>CD300C<br>CD300LB<br>CD300LF<br>CD302<br>CD320<br>CD32<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD36<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40  |       |
| CD300A<br>CD300E<br>CD300LB<br>CD300LF<br>CD302<br>CD32<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD36<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40  | CD300A<br>CD300E<br>CD300LB<br>CD300LF<br>CD302<br>CD32<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   |       |
| CD300C<br>CD300LB<br>CD300LF<br>CD302<br>CD320<br>CD32<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD43<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   | CD300C<br>CD300LB<br>CD300LF<br>CD302<br>CD320<br>CD32<br>CD34<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40  |       |
| CD300E<br>CD300LF<br>CD302<br>CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40  | CD300E<br>CD300LB<br>CD302<br>CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   |       |
| CD300LB<br>CD300LF<br>CD320<br>CD32<br>CD33<br>CD34<br>CD37<br>CD38<br>CD38<br>CD32<br>CD36<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD43<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD51   | CD300LB<br>CD302<br>CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD37<br>CD38<br>CD30<br>CD32<br>CD36<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   |       |
| CD300LF<br>CD320<br>CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD47<br>CD48<br>CD54<br>CD52<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD51<br>CD51<br>CD51  | CD300LF<br>CD320<br>CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3C<br>CD3C<br>CD3C<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD43<br>CD5<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD51<br>CD6<br>CD63   |       |
| CD302<br>CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40  | CD302<br>CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40   |       |
| CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD58<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6   | CD320<br>CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD40<br>CD40LG<br>CD42<br>CD43<br>CD52<br>CD53<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD51<br>CD6<br>CD63   |       |
| CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD43<br>CD43<br>CD52<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD51<br>CD51<br>CD51  | CD33<br>CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD51<br>CD6<br>CD63   |       |
| CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40<br>CD40  | CD34<br>CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40LG<br>CD40<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD51<br>CD6<br>CD63   | CD320 |
| CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6  | CD37<br>CD38<br>CD3D<br>CD3E<br>CD3G<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD51<br>CD6<br>CD63   | CD33  |
| CD38<br>CD3D<br>CD3E<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6  | CD38<br>CD3D<br>CD3E<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63   | CD34  |
| CD3D<br>CD3E<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6  | CD3D<br>CD3E<br>CD4<br>CD40<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63   | CD37  |
| CD3E<br>CD3G<br>CD4<br>CD40<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6  | CD3E<br>CD3G<br>CD4<br>CD40<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63   | CD38  |
| CD3G<br>CD4<br>CD40<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6  | CD3G<br>CD4<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63   | CD3D  |
| CD4<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6  | CD4<br>CD40LG<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6   | CD3E  |
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| CD40<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6   | CD40<br>CD40LG<br>CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63  | CD4   |
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| CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L<br>CD6   | CD44<br>CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63  |       |
| CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6   | CD46<br>CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63  |       |
| CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6   | CD47<br>CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63  |       |
| CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6   | CD48<br>CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63  |       |
| CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L  | CD5<br>CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63  |       |
| CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6  | CD52<br>CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63   |       |
| CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD5L   | CD53<br>CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63   |       |
| CD55<br>CD58<br>CD59<br>CD5L<br>CD6  | CD55<br>CD58<br>CD59<br>CD5L<br>CD6<br>CD63   |       |
| CD58<br>CD59<br>CD5L<br>CD6  | CD58<br>CD59<br>CD5L<br>CD6<br>CD63   |       |
| CD59<br>CD5L<br>CD6  | CD59<br>CD5L<br>CD6<br>CD63   |       |
| CD5L<br>CD6  | CD5L<br>CD6<br>CD63   |       |
| CD6  | CD6<br>CD63   |       |
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CDHR1 CDHR2 CDHR5 CDNF CDON CDSN CEACAM1 CEACAM19 CEACAM21 CEACAM3 CEACAM4 CEACAM5 CEACAM6 CEACAM7 CEACAM8 CECR1 CEL CELA2A CELSR1 CELSR2 CELSR3 CEMIP CEND1 CER1 CES4A CES5A CETP CFB CFC1 CFC1B CFH CFHR1 CFI CFP CFTR CGA CGB1 CGB3 CGB5 CGB7 CGB8 CHAD

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| CLDND1  |
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| CLEC10A |
| CLEC11A |
| CLEC12A |
| CLEC12B |
| CLEC14A |
|         |
| CLEC17A |
| CLEC18A |
| CLEC18B |
| CLEC18C |
| CLEC19A |
|         |
| CLEC1A  |
| CLEC2A  |
| CLEC2B  |
| CLEC2D  |
| CLEC2L  |
|         |
| CLEC3A  |
| CLEC4A  |
| CLEC4C  |
| CLEC4D  |
| CLEC4E  |
|         |
| CLEC4F  |
| CLEC5A  |
| CLEC6A  |
| CLEC7A  |
| CLECL1  |
|         |

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| CLIC1          |
|----------------|
| CLIC4          |
| CLIC6          |
| CLMN           |
| CLMP           |
| CLN3           |
| CLPSL1         |
| CLPSL2         |
| CLPTM1         |
| CLRN1          |
| CLRN3          |
| CLSTN1         |
| CLSTN2         |
| CLSTN3         |
| CLU            |
| CLUL1          |
| CMKLR1         |
| CMTM1          |
| CMTM3          |
| CMTM4          |
| CMTM4<br>CMTM6 |
|                |
| CMTM7          |
| CMTM8          |
| CNGA3          |
| CNGB1          |
| CNIH3          |
| CNNM1          |
| CNNM2          |
| CNNM3          |
| CNNM4          |
| CNPPD1         |
| CNPY4          |
| CNR1           |
| CNR2           |
| CNST           |
| CNTFR          |
| CNTN4          |
| CNTN6          |
| CNTNAP1        |
| CNTNAP2        |
| CNTNAP3        |
| CNTNAP3B       |
|                |

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| CNTNAP5            |
|--------------------|
| COCH               |
| COL10A1            |
| COL11A1            |
| COL11A2            |
| COL12A1            |
| COL13A1            |
| COL14A1            |
| COL15A1            |
| COL16A1            |
| COL17A1            |
| COL18A1            |
| COL1A1             |
| COL1A2             |
| COLIAZ             |
| COL20A1<br>COL21A1 |
| COL22A1            |
|                    |
| COL23A1            |
| COL24A1            |
| COL25A1            |
| COL26A1            |
| COL27A1            |
| COL28A1            |
| COL2A1             |
| COL3A1             |
| COL4A1             |
| COL4A2             |
| COL4A3             |
| COL4A4             |
| COL4A5             |
| COL5A1             |
| COL5A2             |
| COL5A3             |
| COL6A1             |
| COL6A2             |
| COL6A3             |
| COL6A5             |
| COL7A1             |
| COL8A1             |
| COL8A2             |
| COL9A1             |
| COL9A2             |
| 30 L3/ L2          |

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COL9A3 COLEC11 COLEC12 COLQ COMP COMT COPA CORIN CORT СР CPA3 CPA4 CPA6 CPAMD8 CPD CPE CPM CPN1 CPQ CPXM1 CPXM2 CPZ CR1 CR1L CR2 CRB1 CRB2 CRB3 CREG1 CREG2 CRELD1 CRELD2 CRH CRHR1 CRIM1 CRISPLD1 CRISPLD2 CRLF1 CRLF2 CRTAC1 CRTAM CRTAP

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| CSF1<br>CSF1R<br>CSF2<br>CSF2RA<br>CSF2RB<br>CSF3<br>CSF3R<br>CSMD1<br>CSMD2<br>CSMD3<br>CSMD3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1<br>CTAGE1<br>CTAGE4 |
|---|
| CSF2<br>CSF2RA<br>CSF2RB<br>CSF3<br>CSF3R<br>CSMD1<br>CSMD2<br>CSMD3<br>CSN3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1                       |
| CSF2RA<br>CSF2RB<br>CSF3<br>CSF3R<br>CSMD1<br>CSMD2<br>CSMD3<br>CSM3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSF2RA<br>CSF2RB<br>CSF3<br>CSF3R<br>CSMD1<br>CSMD2<br>CSMD3<br>CSM3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSF2RB<br>CSF3<br>CSF3R<br>CSMD1<br>CSMD2<br>CSMD3<br>CSN3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSF3<br>CSF3R<br>CSMD1<br>CSMD2<br>CSMD3<br>CSN3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSF3R<br>CSMD1<br>CSMD2<br>CSMD3<br>CSN3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSMD1<br>CSMD2<br>CSMD3<br>CSN3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1  |
| CSMD2<br>CSMD3<br>CSN3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSMD3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1  |
| CSN3<br>CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSPG4<br>CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSPG5<br>CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1  |
| CST1<br>CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CST2<br>CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CST3<br>CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CST4<br>CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CST5<br>CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CST6<br>CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CST7<br>CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CST9<br>CSTL1<br>CT83<br>CTAGE1   |
| CSTL1<br>CT83<br>CTAGE1   |
| CT83<br>CTAGE1  |
| CT83<br>CTAGE1  |
| CTAGE1  |
|   |
|   |
| CTBS  |
|   |
| CTGF  |
| CTHRC1  |
| CTLA4   |
| CTNS  |
| CTSA  |
| CTSB  |
| CTSC  |
| CTSD  |
|   |
| CTSF  |
|   |
| CTSG  |
| CTSG<br>CTSH  |
| CTSG<br>CTSH<br>CTSK  |
| CTSG<br>CTSH<br>CTSK<br>CTSO  |
| CTSG<br>CTSH<br>CTSK<br>CTSO<br>CTSS  |
| CTSG<br>CTSH<br>CTSK<br>CTSO  |

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| CTXN1   |
|---------|
| CX3CL1  |
| CX3CR1  |
| CXADR   |
| CXCL1   |
| CXCL10  |
| CXCL11  |
| CXCL13  |
| CXCL14  |
| CXCL16  |
| CXCL17  |
| CXCL2   |
|         |
| CXCL3   |
| CXCL5   |
| CXCL6   |
| CXCL8   |
| CXCL9   |
| CXCR1   |
| CXCR2   |
| CXCR3   |
| CXCR4   |
| CXCR5   |
| CXCR6   |
| CXorf36 |
| CYB5D2  |
| СҮВА    |
| CYBB    |
| CYR61   |
| CYSLTR1 |
| CYSLTR2 |
| CYTL1   |
| DAG1    |
| DAGI    |
|         |
| DAGLB   |
| DAND5   |
| DCBLD1  |
| DCBLD2  |
| DCC     |
| DCD     |
| DCHS1   |
| DCHS2   |
| DCST1   |
|         |

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| DCST2    |
|----------|
| DCSTAMP  |
| DDR1     |
| DDR2     |
| DEAF1    |
| DEFA1    |
| DEFA1B   |
| DEFA3    |
| DEFA4    |
| DEFA5    |
| DEFA6    |
| DEFB103A |
| DEFB103B |
| DEFB104B |
| DEFB105A |
| DEFB105B |
| DEFB106B |
| DEFB107B |
| DEFB113  |
| DEFB115  |
| DEFB121  |
| DEFB128  |
| DEFB130  |
| DEFB132  |
| DEFB133  |
| DEFB4A   |
| DEFB4B   |
| DEGS1    |
| DENND5B  |
| DGCR2    |
| DGCKZ    |
|          |
| DHRS11   |
| DHRS13   |
| DHRS3    |
| DHRS4    |
| DHRS4L2  |
| DIO2     |
| DIO3     |
| DISP1    |
| DISP2    |
| DISP3    |
| DKK1     |
|          |

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| DKK2     |
|----------|
| DKK3     |
| DKK4     |
| DKKL1    |
| DLK1     |
| DLK2     |
| DLL1     |
| DLL3     |
| DLL4     |
| DMBT1    |
| DMKN     |
| DMP1     |
| DNASE1   |
| DNASE1L2 |
| DNASE112 |
|          |
| DNER     |
| DPEP1    |
| DPEP2    |
| DPP10    |
| DPP4     |
| DPP7     |
| DRAXIN   |
| DRD1     |
| DRD2     |
| DRD3     |
| DRD4     |
| DRD5     |
| DSC1     |
| DSC2     |
| DSC3     |
| DSCAM    |
| DSCAML1  |
| DSG1     |
| DSG2     |
| DSG3     |
| DSG4     |
| DSPP     |
| DUOX1    |
| DUOX2    |
| DUOXA2   |
| DYNAP    |
| DYSF     |
| 2101     |

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| EBI3    |
|---------|
| EBP     |
| ECE1    |
| ECEL1   |
| ECM1    |
| ECM2    |
| ECSCR   |
| EDA     |
| EDA2R   |
| EDAR    |
| EDDM3A  |
| EDDM3B  |
| EDEM2   |
| EDIL3   |
| EDN1    |
| EDN2    |
| EDN3    |
| EDNRA   |
| EDNRB   |
| EFEMP1  |
| EFEMP2  |
| EFNA1   |
| EFNA2   |
| EFNA3   |
| EFNA4   |
| EFNA5   |
| EFNB1   |
| EFNB2   |
| EFNB3   |
| EGF     |
| EGFL6   |
| EGFL7   |
| EGFL8   |
| EGFLAM  |
| EGFR    |
| ELANE   |
| ELFN1   |
| ELFN2   |
| ELN     |
| ELSPBP1 |
| EMB     |
| EMC10   |

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EMID1 EMILIN1 EMILIN2 EMILIN3 EMP1 EMP2 EMP3 ENAM ENDOD1 ENDOU ENG ENHO ENOX1 ENOX2 ENPEP ENPP1 ENPP2 ENPP3 ENPP4 ENPP5 ENTPD1 ENTPD2 ENTPD3 ENTPD5 ENTPD6 ENTPD8 EPCAM EPDR1 EPGN EPHA1 EPHA10 EPHA2 EPHA3 EPHA4 EPHA5 EPHA6 EPHA7 EPHA8 EPHB1 EPHB2 EPHB3 EPHB4

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EPHB6 EPHX3 EPO EPOR EPPIN-WFDC6 EPYC ERBB2 ERBB3 ERBB4 EREG ERMAP ERP29 ERVFRD-1 ERVMER34-1 ERVV-1 ERVV-2 ERVW-1 ESAM ESM1 EVA1C EVC EVC2 EVI2A EVI2B EXOC3-AS1 EXTL2 EYS F10 F11R F12 F13A1 F2R F2RL1 F2RL2 F2RL3 F3 F5 F7 FADS6 FAIM2 FAM131A FAM132A

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FAM132B FAM150A FAM155A FAM155B FAM159A FAM159B FAM163A FAM163B FAM163B FAM168B FAM171A1 FAM171A2 FAM171B FAM172A FAM173B FAM174A FAM174B FAM180A FAM180B FAM189B FAM198A FAM19A1 FAM19A3 FAM19A4 FAM19A5 FAM209A FAM20A FAM20C FAM210B FAM234A FAM234B FAM24A FAM24B FAM26E FAM26F FAM3A FAM3B FAM3C FAM57A FAP FAS FASLG

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| FAT1         |
|--------------|
| FAT1<br>FAT2 |
| FAT2<br>FAT3 |
|              |
| FAT4         |
| FBLN7        |
| FBN1         |
| FBN2         |
| FBN3         |
| FCER1A       |
| FCER2        |
| FCGR1B       |
| FCGR2A       |
| FCGR2B       |
| FCGR3A       |
| FCGR3B       |
| FCGRT        |
| FCMR         |
| FCN1         |
| FCRL1        |
| FCRL2        |
| FCRL3        |
| FCRL4        |
| FCRL5        |
| FCRL6        |
| FCRLA        |
| FDCSP        |
| FETUB        |
| FFAR1        |
| FFAR2        |
| FFAR3        |
| FFAR4        |
| FGB          |
| FGF1         |
| FGF10        |
| FGF17        |
| FGF18        |
| FGF19        |
| FGF2         |
| FGF20        |
| FGF21        |
| FGF3         |
| FGF4         |
|              |

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| FGF5           |
|----------------|
| FGF7           |
| FGF8           |
| FGF9           |
| FGFBP1         |
| FGFBP2         |
| FGFBP3         |
| FGFR1          |
| FGFR2          |
| FGFR3          |
| FGFR4          |
| FGFRL1         |
| FGL2           |
| FIBIN          |
| FJX1           |
| FKRP           |
| FLRT1          |
| FLRT2          |
| FLRT3          |
| FLT1           |
| FLT3           |
| FLT3LG         |
| FLT4           |
| FLVCR1         |
| FLVCR2         |
| FMOD           |
| FMR1NB         |
| FN1            |
| FNDC1          |
| FNDC4          |
| FNDC5          |
| FNDC9          |
| FOCAD          |
| FOLH1          |
| FOLR1          |
| FOLR1          |
| FOLR2<br>FOLR3 |
|                |
| FPR1           |
| FPR2           |
| FPR3           |
| FRAS1          |
| FREM2          |

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| FREM3  |
|--------|
| FRMD3  |
| FRRS1  |
| FRRS1L |
| FRZB   |
| FSHR   |
| FST    |
| FSTL1  |
| FSTL3  |
| FSTL4  |
| FSTL5  |
| FUCA2  |
| FURIN  |
| FXYD2  |
| FXYD3  |
| FXYD4  |
| FXYD5  |
| FXYD6  |
| FXYD7  |
| FZD1   |
| FZD10  |
| FZD2   |
| FZD3   |
| FZD4   |
| FZD5   |
| FZD6   |
| FZD7   |
| FZD8   |
| FZD9   |
| GABBR1 |
| GABBR2 |
| GABRA1 |
| GABRA2 |
| GABRA3 |
| GABRA4 |
| GABRA5 |
| GABRB1 |
| GABRB2 |
| GABRB3 |
| GABRD  |
| GABRE  |
| GABRG1 |
|        |

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GABRG2 GABRG3 GABRP GABRQ GABRR1 GABRR2 GAL GALNT1 GALNT2 GALR1 GALR2 GALR3 GAPDH GAS6 GAST GBP1 GCGR GDF1 GDF10 GDF11 GDF15 GDF5 GDF6 GDF9 GDNF GDPD1 GDPD2 GFER GFOD1 GFOD2 GFRA1 GFRA3 GGH GGT1 GGT5 GGT6 GGT7 GHRHR GIMAP2 GINM1 GIPR GJA1

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| GJA10    |
|----------|
| GJA3     |
| GJA4     |
| GJA5     |
| GJA9     |
| GJB1     |
| GJB2     |
| GJB3     |
| GJB4     |
| GJB5     |
| GJB6     |
| GJB7     |
| GJC1     |
| GJC2     |
| GJC3     |
| GJD2     |
| GJD3     |
| GLA      |
| GLB1L    |
| GLB1L2   |
| GLDN     |
| GLG1     |
| GLIPR1   |
| GLIPR1L2 |
| GLP1R    |
| GLP2R    |
| GLRA1    |
| GLRA2    |
| GLRA3    |
| GLRA4    |
| GLRB     |
| GNAS     |
| GNLY     |
| GNPTG    |
| GNRH1    |
| GNRHR    |
| GOLM1    |
| GP1BA    |
| GP1BB    |
| GP2      |
| GP5      |
| GP6      |

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| CDO     |
|---------|
| GP9     |
| GPA33   |
| GPC1    |
| GPC2    |
| GPC3    |
| GPC4    |
| GPC6    |
| GPER1   |
| GPI     |
| GPLD1   |
| GPM6B   |
| GPNMB   |
| GPR1    |
| GPR119  |
| GPR12   |
| GPR132  |
| GPR135  |
| GPR137  |
| GPR137B |
| GPR137C |
| GPR141  |
| GPR143  |
| GPR148  |
| GPR149  |
| GPR150  |
| GPR152  |
| GPR153  |
| GPR155  |
| GPR156  |
| GPR157  |
| GPR158  |
| GPR160  |
| GPR161  |
| GPR162  |
| GPR171  |
| GPR173  |
| GPR174  |
| GPR176  |
| GPR179  |
| GPR18   |
| GPR180  |
| GPR182  |
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**GPR183** GPR19 GPR20 GPR21 GPR22 GPR26 GPR27 GPR3 GPR31 GPR32 GPR34 GPR35 GPR37 GPR37L1 GPR39 GPR4 GPR50 GPR52 GPR55 GPR6 GPR63 GPR65 GPR68 GPR75 GPR78 GPR82 GPR83 GPR84 GPR85 GPR87 GPR88 GPRC5A GPRC5B GPRC5C GPRC5D GPRC6A GPX3 GPX4 GPX7 GRAMD1A GRAMD1B GRAMD2

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| GREB1  |
|--------|
| GREM1  |
| GRIA1  |
| GRIA2  |
| GRIA3  |
| GRID1  |
| GRIK2  |
| GRIK3  |
| GRIK4  |
| GRIK5  |
| GRIN2A |
| GRIN2B |
| GRIN2C |
| GRIN2D |
| GRIN3A |
| GRIN3B |
| GRM2   |
| GRM4   |
| GRM6   |
| GRM8   |
| GRN    |
| GRP    |
| GRPR   |
| GSG1L  |
| GUCY2C |
| GUCY2D |
| GUCY2F |
| GYPA   |
| GYPB   |
| GYPC   |
| GYPE   |
| GZMA   |
| GZMK   |
| GZMM   |
| HABP2  |
| HAMP   |
| HAPLN1 |
| HAPLN3 |
| HAPLN4 |
| HAS1   |
| HAS2   |
| HAS3   |
|        |

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HAVCR1 HAVCR2 HBEGF HCAR1 HCAR2 HCAR3 HCN2 HCN3 HCST HEG1 HEPH HEPHL1 HFE HGFAC HHIP HHIPL1 HHIPL2 HHLA1 HHLA2 HILPDA HLA-A HLA-B HLA-C HLA-DRB1 HLA-DRB5 HLA-G HM13 HMCN1 HMCN2 HMSD ΗP HPN HPR HPSE НРХ HRH1 HRH2 HRH3 HRH4 HSD11B1L HSD17B11 HSD17B7

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| HSPG2   |
|---------|
| HTN3    |
| HTR1B   |
| HTR1D   |
| HTR1E   |
| HTR1F   |
| HTR2A   |
| HTR2B   |
| HTR2C   |
| HTR3A   |
| HTR4    |
| HTR6    |
| HTR7    |
| HTRA1   |
| HTRA3   |
| HTRA4   |
| HYAL2   |
| HYAL3   |
| IBSP    |
| ICAM1   |
| ICAM2   |
| ICAM3   |
| ICAM4   |
| ICAM5   |
| ICOS    |
| ICOSLG  |
| IDE     |
| IFI30   |
| IFI6    |
| IFITM1  |
| IFITM10 |
| IFNA1   |
| IFNA10  |
| IFNA13  |
| IFNA14  |
| IFNA16  |
| IFNA17  |
| IFNA2   |
| IFNA21  |
| IFNA4   |
| IFNA5   |
| IFNA6   |
| -       |

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IFNA7 IFNA8 IFNAR1 IFNAR2 IFNB1 IFNE IFNG IFNGR1 IFNGR2 IFNK IFNL1 IFNL2 IFNL3 IFNLR1 IFNW1 IGDCC3 IGDCC4 IGF1 IGF1R IGF2 IGF2R IGFALS IGFBP1 IGFBP2 IGFBP3 IGFBP4 IGFBP5 IGFBP6 IGFBP7 IGFBPL1 IGFL1 IGFL2 IGFL3 IGFL4 IGFLR1 IGIP IGLL1 IGLL5 IGLON5 IGSF1 IGSF10 IGSF11

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| IGSF21         |
|----------------|
| IGSF23         |
| IGSF3          |
| IGSF5          |
| IGSF6          |
| IGSF8          |
| IGSF9          |
| IGSF9B         |
| IL10           |
| IL10RA         |
| IL10RB         |
| IL11           |
| IL11RA         |
| IL12A          |
| IL12R          |
| IL12RB1        |
| IL12RB2        |
| IL13           |
| IL13RA1        |
| IL13RA2        |
| IL15           |
| IL15RA         |
| IL17A          |
| IL17B          |
| IL17C          |
| IL170          |
| IL17E          |
| IL17RA         |
| IL17RB         |
| IL17RC         |
| IL17RD         |
| IL17RE         |
| IL18           |
| IL18BP         |
| IL18R1         |
| IL18RAP        |
| IL18NAP        |
| IL19<br>IL1A   |
| IL1A<br>IL1B   |
| IL1B           |
| ILIFIO         |
| ILIRI<br>IL1R2 |
|                |

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| IL1RAP   |
|----------|
| IL1RAPL1 |
| IL1RAPL2 |
| IL1RL1   |
| IL1RL2   |
| IL1RN    |
| IL2      |
| IL20     |
| IL20RA   |
| IL20RA   |
| IL20KB   |
|          |
| IL21R    |
| IL22     |
| IL22RA1  |
| IL22RA2  |
| IL23A    |
| IL23R    |
| IL24     |
| IL25     |
| IL26     |
| IL27     |
| IL27RA   |
| IL2RA    |
| IL2RB    |
| IL2RG    |
| IL3      |
| IL31     |
| IL31RA   |
| IL32     |
| IL33     |
| IL34     |
| IL36A    |
| IL36B    |
| IL36G    |
| IL36RN   |
| IL37     |
| IL3RA    |
| IL4      |
| IL4I1    |
| IL4R     |
| IL5      |
| IL5RA    |
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| IL6    |
|--------|
| IL6R   |
| IL6ST  |
| IL7    |
| IL7R   |
| IL9    |
| IL9R   |
| ILDR1  |
| IMPG2  |
| INADL  |
| INHA   |
| INHBA  |
| INHBA  |
| INS    |
| INSL3  |
| INSL3  |
|        |
| INSL6  |
| INSR   |
| ISG15  |
| ISLR   |
| ISLR2  |
| ISM1   |
| ISM2   |
| ITFG1  |
| ITGA1  |
| ITGA10 |
| ITGA11 |
| ITGA2  |
| ITGA2B |
| ITGA3  |
| ITGA4  |
| ITGA5  |
| ITGA6  |
| ITGA7  |
| ITGA8  |
| ITGA9  |
| ITGAD  |
| ITGAE  |
| ITGAL  |
| ITGAM  |
| ITGAV  |
| ITGAV  |
|        |

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ITGB1 ITGB2 ITGB3 ITGB4 ITGB5 ITGB6 ITGB7 ITGB8 ITGBL1 ITIH2 ITIH3 ITIH4 ITIH6 ITLN1 ITLN2 ITM2C ITPR2 ITPR3 ITPRIPL1 IYD IZUMO2 IZUMO3 IZUMO4 JAG1 JAG2 JAM3 JAML JPH1 JTB KAZALD1 KCNA1 KCNA10 KCNA2 KCNA3 KCNA4 KCNA5 KCNA6 KCNB2 KCNC1 KCNC2 KCNC3 KCND1

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| KCND2  |
|--------|
| KCNE3  |
| KCNE4  |
| KCNE5  |
| KCNF1  |
| KCNG1  |
| KCNG2  |
| KCNG3  |
| KCNH1  |
| KCNH2  |
| KCNH5  |
| KCNH6  |
| KCNH7  |
| KCNH8  |
| KCNJ14 |
| KCNJ15 |
| KCNJ3  |
| KCNJ5  |
| KCNJ6  |
| KCNJ8  |
| KCNK1  |
| KCNK12 |
| KCNK15 |
| KCNK17 |
| KCNK2  |
| KCNK3  |
| KCNK4  |
| KCNK5  |
| KCNK6  |
| KCNK9  |
| KCNMB2 |
| KCNMB3 |
| KCNMB4 |
| KCNN2  |
| KCNN4  |
| KCNQ1  |
| KCNQ4  |
| KCNQ5  |
| KCNS1  |
| KCNS3  |
| KCNT2  |
| КСР    |
|        |

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| KDR       |
|-----------|
| KDSR      |
| KHDC1     |
| KIAA0100  |
| KIAA0319  |
| KIAA0319L |
| KIAA0922  |
| KIAA1324L |
| KIAA1524  |
| KIAA1549L |
| KIAA2013  |
| KIR2DL1   |
| KIR2DL2   |
| KIR2DL3   |
| KIR2DL4   |
| KIR2DS4   |
| KIR3DL1   |
| KIR3DL2   |
| KIRREL    |
| KIRREL3   |
| KISS1     |
| KISS1R    |
| KIT       |
| KITLG     |
| KLK10     |
| KLK12     |
| KLK13     |
| KLK14     |
| KLK15     |
| KLK2      |
| KLK3      |
| KLK4      |
| KLK5      |
| KLK6      |
| KLK7      |
| KLK8      |
| KLK9      |
| KLRB1     |
| KLRC1     |
| KLRC2     |
| KLRD1     |
| KLRF1     |
|           |

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KLRF2 KLRG1 KLRG2 KLRK1 KMT2E KREMEN1 **KREMEN2** KRTCAP3 KRTDAP L1CAM LACRT LAD1 LAG3 LAIR1 LAIR2 LAMA1 LAMA3 LAMA4 LAMA5 LAMB1 LAMB2 LAMB3 LAMB4 LAMC1 LAMC2 LAMC3 LAMP5 LAPTM5 LAX1 LAYN LCN10 LCN12 LCN2 LCN8 LCT LDLR LDLRAD1 LDLRAD3 LECT1 LEFTY1 LEFTY2 LEPR

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LFNG LGALS1 LGALS3 LGALS3BP LGALS7 LGALS7B LGALS9 LGI2 LGI3 LGR4 LGR5 LGR6 LHCGR LIF LIFR LILRA1 LILRA3 LILRA5 LILRA6 LILRB1 LILRB2 LILRB3 LILRB4 LING01 LINGO2 LINGO3 LINGO4 LIPA LIPG LIPH LIPN LMBR1 LMBR1L LMBRD2 LMTK3 LNPEP LOC729756 LOX LOXL1 LOXL2 LOXL3 LOXL4

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| LPAR1    |
|----------|
| LPAR2    |
| LPAR3    |
| LPAR4    |
| LPAR5    |
| LPAR6    |
| LPL      |
| LPO      |
| LRCH3    |
| LRFN1    |
| LRFN2    |
| LRFN3    |
| LRFN4    |
| LRIG1    |
| LRIG2    |
|          |
| LRIG3    |
| LRMP     |
| LRP1     |
| LRP10    |
| LRP11    |
| LRP12    |
| LRP1B    |
| LRP3     |
| LRP4     |
| LRP5     |
| LRP6     |
| LRP8     |
| LRPAP1   |
| LRRC15   |
| LRRC17   |
| LRRC24   |
| LRRC26   |
| LRRC3    |
| LRRC32   |
| LRRC37A  |
| LRRC37A2 |
| LRRC37A3 |
| LRRC37B  |
| LRRC38   |
| LRRC3B   |
| LRRC3C   |
| LRRC4    |
|          |

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LRRC4C LRRC52 LRRC55 LRRC66 LRRC70 LRRC8A LRRC8B LRRC8C LRRC8D LRRC8E LRRN1 LRRN2 LRRN3 LRRN4 LRRN4CL LRRTM1 LRRTM2 LRRTM3 LRTM2 LRTOMT LSR LTA LTB LTB4R LTB4R2 LTBP1 LTBP2 LTBP3 LTBR LTK LUM LUZP2 LY6D LY6E LY6G5B LY6G5C LY6G6D LY6G6F LY6K LY75 LY86 LY9

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LY96 LYG1 LYPD3 LYPD5 LYPD6 LYPD6B LYSMD3 LYZ M6PR MADCAM1 MAG MAGT1 MALL MAMDC4 MAN2B2 MANF MANSC4 MARCH1 MARCO MARVELD1 MARVELD3 MAS1 MASP2 MATN3 MATN4 MC1R MC4R MCAM MCEMP1 MCOLN1 MCOLN2 MCOLN3 MCTP1 MCTP2 MDK MEGF10 MEGF11 MEGF6 MEGF8 MEGF9 MEP1A MERTK

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| MET     |
|---------|
| METRN   |
| METRNL  |
| METTL24 |
| MFAP1   |
| MFAP2   |
| MFAP3   |
| MFAP3L  |
| MFGE8   |
| MFNG    |
| MFRP    |
| MFSD1   |
| MFSD10  |
| MFSD11  |
| MFSD13A |
| MFSD14B |
| MFSD2A  |
| MFSD2B  |
| MFSD3   |
| MFSD4B  |
| MFSD5   |
| MFSD6   |
| MFSD6L  |
| MFSD7   |
| MFSD9   |
| MGAM    |
| MGAT4A  |
| MGAT4D  |
| MGP     |
| MGST2   |
| MIA     |
| MIA2    |
| MICA    |
| MICB    |
| MIF     |
| MILR1   |
| MLANA   |
| MLC1    |
| MLNR    |
| MMD     |
| MMEL1   |
| MMP1    |
|         |

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MMP10 MMP11 MMP12 MMP13 MMP14 MMP15 MMP16 MMP17 MMP19 MMP2 MMP23B MMP24 MMP25 MMP28 MMP3 MMP7 MMP8 MMP9 MPEG1 MPL MPO MPZL1 MPZL2 MPZL3 MR1 MRC1 MRC2 MRGPRE MS4A1 MS4A14 MS4A15 MS4A18 MS4A2 MS4A3 MS4A4A MS4A4E MS4A6A MS4A6E MS4A7 MSLN MSMB MSM01

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| MSMP      |
|-----------|
| MSR1      |
| MST1      |
| MST1R     |
| MTDH      |
| MTHFD2    |
| MTNR1B    |
| MTRNR2L1  |
|           |
| MTRNR2L10 |
| MTRNR2L3  |
| MTRNR2L4  |
| MTRNR2L5  |
| MTRNR2L6  |
| MTRNR2L7  |
| MTRNR2L8  |
| MUC1      |
| MUC12     |
| MUC13     |
| MUC16     |
| MUC17     |
| MUC20     |
| MUC21     |
| MUC22     |
| MUC3A     |
| MUC3A     |
| MUC4      |
| MUC5AC    |
| MUC5B     |
| MUC6      |
| MUC7      |
| MUCL1     |
| MUSK      |
| MXRA5     |
|           |
| MXRA8     |
| MYADM     |
| MYADML2   |
| MYDGF     |
| MYOF      |
| MZB1      |
| NAALADL2  |
| NALCN     |
| NAMPT     |
|           |

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NBL1 NCAM1 NCAM2 NCKAP1L NCMAP NCR1 NCR2 NCR3 NCR3LG1 NCSTN NDFIP1 NDP NELL1 NELL2 NENF NEO1 NETO1 NETO2 NFAM1 NGF NGFR NGRN NHLRC3 NID1 NID2 NINJ1 NINJ2 NIPA1 NIPA2 NIPAL1 NIPAL2 NIPAL3 NIPAL4 NKAIN1 NKAIN2 NKAIN3 NKAIN4 NKG7 NKPD1 NLGN1 NLGN2 NLGN3

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NLGN4X NLGN4Y NMB NME3 NMS NMU NMUR1 NMUR2 NODAL NOG NOM01 NOMO3 Non-targeting pool NOTCH1 NOTCH2 NOTCH2NL NOTCH2NL NOTCH3 NOTCH4 NOTUM NOV NOX1 NOX3 NOX4 NPBWR1 NPC1 NPC1L1 NPC2 NPDC1 NPFFR1 NPFFR2 NPIPB15 NPNT NPPB NPPC NPR1 NPR2 NPR3 NPSR1 NPTN NPTX2 NPW

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| NPY     |
|---------|
| NPY2R   |
| NPY4R   |
| NRCAM   |
| NRG1    |
| NRG2    |
| NRG3    |
| NRG4    |
| NRN1    |
| NRP1    |
| NRP2    |
| NRROS   |
| NRSN1   |
| NRSN2   |
| NRTN    |
| NRXN1   |
| NRXN2   |
| NRXN3   |
| NT5E    |
| NTF3    |
| NTF4    |
| NTN1    |
| NTN3    |
| NTN5    |
| NTRK1   |
| NTRK2   |
| NTRK3   |
| NTS     |
| NTSR1   |
| NUCB2   |
| NXPE3   |
| NXPH4   |
| OAS1    |
| OBP2A   |
| OCLN    |
| ODAM    |
| OGFOD3  |
| OLFM1   |
| OLFM2   |
| OLFM3   |
| OLFM4   |
| OLFML2B |

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| OLR1             |
|------------------|
| OPALIN           |
| OPN3             |
| OPRK1            |
| OPRL1            |
| OR10H2           |
| OR10112          |
| OR11/1           |
| OR12D2           |
| OR1205<br>OR13A1 |
| OR1D2            |
| OR102<br>OR111   |
| OR1L8            |
| OR1N1            |
| OR2A4            |
| OR2A7            |
| OR2AK2           |
| OR2B6            |
| OR2L13           |
| OR2L2            |
| OR2T8            |
| OR2W1            |
| OR2W3            |
| OR3A1            |
| OR3A2            |
| OR3A3            |
| OR4C6            |
| OR4D1            |
| OR4F16           |
| OR4N2            |
| OR4N4            |
| OR51A4           |
| OR51B4           |
| OR51B5           |
| OR51B6           |
| OR51E1           |
| OR51E2           |
| OR52A1           |
| OR52B6           |
| OR52D1           |
| OR52H1           |
| OR52J3           |
|                  |

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OR52K1 OR52K2 **OR52N4** OR52R1 OR56A3 OR56B1 OR5AP2 OR5C1 OR5H1 OR5P3 OR6Y1 OR7A5 OR7C1 OR7C2 OR7D2 **OR7E24** ORAI1 ORAI2 ORAI3 ORM1 ORM2 OSM OSMR ΟΤΟΑ OTOG OVOS OVOS2 OXER1 OXGR1 OXTR P2RX1 P2RX2 P2RX3 P2RX4 P2RX5 P2RX6 P2RX7 P2RY1 P2RY10 P2RY11 P2RY12 P2RY13

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| P2RY14  |
|---------|
| P2RY2   |
| P2RY4   |
| P2RY6   |
| P2RY8   |
| P3H1    |
| P4HB    |
| PAEP    |
| PAM     |
| PANX1   |
| PANX2   |
| PAPLN   |
| PAPPA   |
| PAQR5   |
| PAQR6   |
| PAQR7   |
| PAQR8   |
| PAQR9   |
| PARM1   |
| PCDH1   |
| PCDH10  |
| PCDH11X |
| PCDH11Y |
| PCDH12  |
| PCDH15  |
| PCDH17  |
| PCDH18  |
| PCDH19  |
| PCDH20  |
| PCDH7   |
| PCDH8   |
| PCDHA1  |
| PCDHA10 |
| PCDHA11 |
| PCDHA12 |
| PCDHA13 |
| PCDHA2  |
| PCDHA3  |
| PCDHA4  |
| PCDHA5  |
| PCDHA6  |
| PCDHA7  |

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PCDHA8 PCDHA9 PCDHAC1 PCDHAC2 PCDHB10 PCDHB11 PCDHB12 PCDHB13 PCDHB14 PCDHB15 PCDHB16 PCDHB2 PCDHB3 PCDHB4 PCDHB5 PCDHB6 PCDHB7 PCDHB8 PCDHB9 PCDHGA1 PCDHGA10 PCDHGA11 PCDHGA12 PCDHGA2 PCDHGA3 PCDHGA4 PCDHGA5 PCDHGA6 PCDHGA7 PCDHGA8 PCDHGA9 PCDHGB1 PCDHGB2 PCDHGB3 PCDHGB4 PCDHGB5 PCDHGB6 PCDHGB7 PCDHGC4 PCNX PCNXL3 PCNXL4

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PCOLCE PCSK1 PCSK1N PCSK2 PCSK4 PCSK5 PCSK6 PCSK9 PCYOX1L PDCD1 PDCD1LG2 PDDC1 PDE3A PDGFA PDGFB PDGFC PDGFD PDGFRA PDGFRB PDGFRL PDPN PDYN PDZK1IP1 PEAR1 PECAM1 PF4 PF4V1 PGF PGLYRP1 PGLYRP3 PGLYRP4 PGRMC2 PHB PHEX PI15 PI3 PIANP PIEZO1 PIEZO2 PIGR PIGU PIGY

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| PIK3IP1          |
|------------------|
| PILRA            |
| PILRB            |
| PINLYP           |
| PKD1             |
| PKD1L1           |
| PKD1L2           |
| PKD2             |
| PKD2L1           |
| PKD2L2           |
| PKDCC            |
| PKDREJ           |
| PKHD1            |
| PKHD1L1          |
| PLA1A            |
| PLA2G10          |
| PLA2G12A         |
| PLA2G15          |
| PLA2G2A          |
| PLA2G2D          |
| PLA2G2F          |
| PLA2G3           |
| PLA2G7           |
| PLAC1            |
| PLAT             |
| PLAU             |
| PLAUR            |
| PLB1             |
| PI BD1           |
| PLGRKT           |
| PLLP             |
| PLP2             |
| PLPP1            |
| PLPP2            |
| PLPP4            |
| PLPP5            |
| PLPP6            |
| PLPPR2           |
| PLPPR2<br>PLPPR3 |
| PLPPRS           |
| PLTP<br>PLVAP    |
| PLVAP<br>PLXDC1  |
| PLADUI           |

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PLXDC2 PLXNA1 PLXNA2 PLXNA3 PLXNA4 PLXNB1 PLXNB2 PLXNB3 PLXNC1 PLXND1 PMCH PMEL PMEPA1 PMP22 PNLIPRP3 PNOC PODNL1 PODXL PODXL2 POMC POPDC2 POPDC3 POSTN PPBP PPIA PPT2 PQLC1 PRADC1 PRAP1 PRB3 PRDX4 PRF1 PRG2 PRG3 PRG4 PRH1 PRH2 PRIMA1 PRL PRLH PRLR PRNP

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| PROCR  |
|--------|
| PROK1  |
| PROK2  |
| PROL1  |
| PROM1  |
| PROM2  |
| PROS1  |
| PRPH2  |
| PRR27  |
| PRR4   |
| PRRG1  |
| PRRG2  |
| PRRG3  |
| PRRG4  |
| PRRT1  |
| PRRT2  |
| PRRT3  |
| PRRT4  |
| PRSS12 |
| PRSS2  |
| PRSS22 |
| PRSS23 |
| PRSS27 |
| PRSS33 |
| PRSS35 |
| PRSS36 |
| PRSS53 |
| PRSS57 |
| PRSS58 |
| PRSS8  |
| PRTG   |
| PRTN3  |
| PSAP   |
| PSCA   |
| PSEN1  |
| PSEN2  |
| PSENEN |
| PSG1   |
| PSG2   |
| PSG3   |
| PSG4   |
| PSG5   |

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PSG6 PSG7 PSG8 PSG9 PSMD1 PSORS1C2 PTAFR PTCH1 PTCH2 PTCHD1 PTCHD3 PTCHD4 PTCRA PTGDR PTGDR2 PTGDS PTGER1 PTGER2 PTGER3 PTGER4 PTGFR PTGIR PTH1R PTH2 PTH2R PTHLH PTK7 PTPRA PTPRB PTPRC PTPRD PTPRE PTPRF PTPRG PTPRH PTPRJ PTPRK PTPRM PTPRN PTPRN2 PTPRO PTPRQ

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PTPRR PTPRS PTPRT PTPRU PTPRZ1 PTX3 PTX4 PVR **PVRIG** PVRL1 PVRL2 PVRL3 PVRL4 PXDN PXDNL QPCT QPRT QRFP QRFPR QSOX1 QSOX2 **R3HDML** RAET1E RAET1G RAET1L RAMP1 RAMP2 RAMP3 RARRES2 RCE1 RECK REG1A REG1B REG3A REG3G REG4 RELL1 RELL2 RELN RELT REN RET

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| DETN    |
|---------|
| RETN    |
| RGMB    |
| RGR     |
| RGSL1   |
| RHAG    |
| RHBDD3  |
| RHBDF2  |
| RHBDL1  |
| RHBDL2  |
| RHBDL3  |
| RHBG    |
| RHCE    |
| RHCG    |
| RHD     |
| RIC1    |
| RLN1    |
| RLN2    |
| RLN3    |
| RNASE1  |
| RNASE10 |
| RNASE2  |
| RNASE3  |
| RNASE6  |
| RNASE7  |
| RNASEK  |
| RNASET2 |
| RNF130  |
| RNF145  |
| RNF148  |
| RNF149  |
| RNF183  |
| RNF19B  |
| RNF215  |
| RNF217  |
| RNF223  |
| RNF26   |
| RNF43   |
| RNFT1   |
| RNFT2   |
| RNLS    |
| RNPEP   |
| ROBO1   |
| NODOT   |

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| ROBO2   |
|---------|
| ROBO3   |
| ROBO4   |
| ROM1    |
| ROR1    |
| ROR2    |
| ROS1    |
| RPL9    |
| RPTN    |
| RSPO1   |
| RSPO4   |
| RSPRY1  |
| RTBDN   |
| RTL1    |
| RTN4R   |
| RXFP1   |
| RXFP2   |
| RXFP4   |
| RYK     |
| RYR1    |
| S100A12 |
| S100A13 |
| S100A7  |
| S100A8  |
| S100A9  |
| S1PR2   |
| S1PR3   |
| S1PR4   |
| S1PR5   |
| SAA1    |
| SAA2    |
| SAA4    |
| SAMD1   |
| SAYSD1  |
| SBSN    |
| SBSPON  |
| SCAMP5  |
| SCARB1  |
| SCARF1  |
| SCARF2  |
| SCG2    |
| SCG3    |

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SCG5 SCGB1D1 SCGB1D2 SCGB2A1 SCGN SCIMP SCN1B SCN2A SCN3A SCN4A SCN5A SCN8A SCN9A SCNN1A SCNN1D SCNN1G SCPEP1 SCRG1 SCT SCTR SCUBE1 SCUBE2 SCUBE3 SDC1 SDC2 SDC3 SDC4 SDF2 SDF4 SDK1 SDK2 SECTM1 SELL SELPLG SEMA3A SEMA3B SEMA3C SEMA3D SEMA3E SEMA3F SEMA4A SEMA4B

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SEMA4C SEMA4D SEMA4F SEMA4G SEMA5A SEMA5B SEMA6A SEMA6B SEMA6C SEMA6D SEMA7A SEMG1 SEPP1 SERINC2 SERINC4 SERPINA1 SERPINA10 SERPINA11 SERPINA12 SERPINA3 SERPINA5 SERPINA6 SERPINA9 SERPINB2 SERPINB3 SERPINB4 SERPINB5 SERPINE1 SERPINE2 SERPINF1 SERPING1 SERPINI1 SERPINI2 SERTM1 SETDB1 SEZ6 SEZ6L2 SFN SFRP2 SFRP4 SFRP5 SFTA2

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| SFTPA2   |
|----------|
| SFTPB    |
| SGCB     |
| SGCD     |
| SGCE     |
| SGMS2    |
| SHISA4   |
| SHISA6   |
| SHISA7   |
| SHISA8   |
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| ID     | 2035                            |
|--------|---------------------------------|
| Title  | General Conditions - Appendix C |
| Date   | 2011-05-16                      |
| Status | Active                          |

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## 2035 01 (2008-05-12) Interpretation

In the Contract, unless the context otherwise requires:

"Articles of Agreement" means the clauses and conditions incorporated in full text to form the body of the Contract; it does not include these general conditions, any supplemental general conditions, annexes, the Contractor's bid or any other document;

"Canada", "Crown", "Her Majesty" or "the Government" means Her Majesty the Queen in right of Canada as represented by the National Research Council of Canada and any other person duly authorized to act on behalf of the National Research Council Canada.

"Contract" means the Articles of Agreement, these general conditions, any supplemental general conditions, annexes and any other document specified or referred to as forming part of the Contract, all as amended by agreement of the Parties from time to time;

"Contracting Authority" means the person designated by that title in the Contract, or by notice to the Contractor, to act as Canada's representative to manage the Contract;

"Contractor" means the person, entity or entities named in the Contract to supply goods, services or both to Canada;

"Contract Price" means the amount stated in the Contract to be payable to the Contractor for the Work, exclusive of Goods and Services Tax and Harmonized Sales Tax;

"Government Property" means anything supplied to the Contractor by or on behalf of Canada for the purposes of performing the Contract and anything acquired by the Contractor in any manner in connection with the Work, the cost of which is paid by Canada under the Contract;

"Party" means Canada, the Contractor, or any other signatory to the Contract and "Parties" means all of them;

"Specifications" means the description of the essential, functional or technical requirements of the Work in the Contract, including the procedures for determining whether the requirements have been met;

"Work" means all the activities, services, goods, equipment, matters and things required to be done, delivered or performed by the Contractor under the Contract.

## 2035 02 (2008-05-12) Powers of Canada

All rights, remedies, powers and discretions granted or acquired by Canada under the Contract or by law are cumulative, not exclusive.

## 2035 03 (2008-05-12) Status of the Contractor

The Contractor is an independent contractor engaged by Canada to perform the Work. Nothing in the Contract is intended to create a partnership, a joint venture or an agency between Canada and the other Party or Parties. The Contractor must not represent itself as an agent or representative of Canada to anyone. Neither the Contractor nor any of its personnel is engaged as an employee or agent of Canada. The Contractor is responsible for all deductions and remittances required by law in relation to its employees.

## 2035 04 (2008-05-12) Conduct of the Work

- 1. The Contractor represents and warrants that:
  - (a) it is competent to perform the Work;
  - (b) it has everything necessary to perform the Work, including the resources, facilities, labour, technology, equipment, and materials; and
  - (c) it has the necessary qualifications, including knowledge, skill, know-how and experience, and the ability to use them effectively to perform the Work.
- 2. The Contractor must:
  - (a) perform the Work diligently and efficiently;
  - (b) except for Government Property, supply everything necessary to perform the Work;
  - (c) use, as a minimum, quality assurance procedures, inspections and controls generally used and recognized by the industry to ensure the degree of quality required by the Contract;
  - (d) select and employ a sufficient number of qualified people;
  - (e) perform the Work in accordance with standards of quality acceptable to Canada and in full conformity with the Specifications and all the requirements of the Contract;
  - (f) provide effective and efficient supervision to ensure that the quality of workmanship meets the requirements of the Contract.
- 3. The Work must not be performed by any person who, in the opinion of Canada, is incompetent, unsuitable or has been conducting himself/herself improperly.
- 4. All services rendered under the Contract must, at the time of acceptance, be free from defects in workmanship and conform to the requirements of the Contract. If the Contractor is required to correct or replace the Work or any part of the Work, it will be at no cost to Canada.
- 5. Canada's facilities, equipment and personnel are not available to the Contractor to perform the Work unless the Contract specifically provides for it. The Contractor is responsible for advising the Contracting Authority in advance if it requires access to Canada's facilities, equipment or personnel to perform the Work. The Contractor must comply and ensure that its employees and subcontractors comply with all security measures, standing orders, policies or other rules in force at the site where the Work is performed.
- 6. Unless the Contracting Authority orders the Contractor to suspend the Work or part of the Work pursuant to section 27, the Contractor must not stop or suspend the Work or part of the Work pending the settlement of any dispute between the Parties about the Contract.
- 7. The Contractor must provide all reports that are required by the Contract and any other information that Canada may reasonably require from time to time.
- 8. The Contractor is fully responsible for performing the Work. Canada will not be responsible for any negative consequences or extra costs if the Contractor follows any advice given by Canada unless the Contracting Authority provides the advice to the Contractor in writing and includes a statement specifically relieving the

Contractor of any responsibility for negative consequences or extra costs that might result from following the advice.

## 2035 05 (2010-01-11) Subcontracts

- 1. Except as provided in subsection 2, the Contractor must obtain the Contracting Authority's written consent before subcontracting or permitting the subcontracting of any part of the Work. A subcontract includes a contract entered into by any subcontractor at any tier to perform any part of the Work.
- 2. The Contractor is not required to obtain consent for subcontracts specifically authorized in the Contract. The Contractor may also without the consent of the Contracting Authority:
  - (a) purchase "off-the-shelf" items and any standard articles and materials that are ordinarily produced by manufacturers in the normal course of business;
  - (b) subcontract any portion of the Work as is customary in the carrying out of similar contracts; and;
  - (c) permit its subcontractors at any tier to make purchases or subcontract as permitted in paragraphs (a) and (b).
- 3. In any subcontract other than a subcontract referred to in paragraph 2.(a), the Contractor must, unless the Contracting Authority agrees in writing, ensure that the subcontractor is bound by conditions compatible with and, in the opinion of the Contracting Authority, not less favourable to Canada than the conditions of the Contract.
- 4. Even if Canada consents to a subcontract, the Contractor is responsible for performing the Contract and Canada is not responsible to any subcontractor. The Contractor is responsible for any matters or things done or provided by any subcontractor under the Contract and for paying any subcontractors for any part of the Work they perform.

#### 2035 06 (2008-05-12) Specifications

- 1. Specifications provided by Canada or on behalf of Canada to the Contractor in connection with the Contract belong to Canada and must be used by the Contractor only for the purpose of performing the Work.
- 2. If the Contract provides that Specifications furnished by the Contractor must be approved by Canada, that approval will not relieve the Contractor of its responsibility to meet all requirements of the Contract.

#### 2035 07 (2008-05-12) Replacement of Specific Individuals

- 1. If specific individuals are identified in the Contract to perform the Work, the Contractor must provide the services of those individuals unless the Contractor is unable to do so for reasons beyond its control.
- 2. If the Contractor is unable to provide the services of any specific individual identified in the Contract, it must provide a replacement with similar qualifications and experience. The replacement must meet the criteria used in the selection of the Contractor and be acceptable to Canada. The Contractor must, as soon as possible, give notice to the Contracting Authority of the reason for replacing the individual and provide:
  - (a) the name, qualifications and experience of the proposed replacement; and
  - (b) proof that the proposed replacement has the required security clearance granted by Canada, if applicable.
- 3. The Contractor must not, in any event, allow performance of the Work by unauthorized replacement persons. The Contracting Authority may order that a replacement stop performing the Work. In such a case, the Contractor must immediately comply with the order and secure a further replacement in accordance with subsection 2. The fact that the Contracting Authority does not order that a replacement stop performing the Work does not relieve the Contractor from it's responsibility to meet the requirements of the Contract.

#### 2035 08 (2008-05-12) Time of the Essence

It is essential that the Work be performed within or at the time stated in the Contract.

## 2035 09 (2008-05-12) Excusable Delay

- 1. A delay in the performance by the Contractor of any obligation under the Contract that is caused by an event that
  - (a) is beyond the reasonable control of the Contractor,
  - (b) could not reasonably have been foreseen,
  - (c) could not reasonably have been prevented by means reasonably available to the Contractor, and
  - (d) occurred without the fault or neglect of the Contractor,

will be considered an "Excusable Delay" if the Contractor advises the Contracting Authority of the occurrence of the delay or of the likelihood of the delay as soon as the Contractor becomes aware of it. The Contractor must also advise the Contracting Authority, within seven (7) working days, of all the circumstances relating to the delay and provide to the Contracting Authority for approval a clear work around plan explaining in detail the steps that the Contractor proposes to take in order to minimize the impact of the event causing the delay.

- 2. Any delivery date or other date that is directly affected by an Excusable Delay will be postponed for a reasonable time that will not exceed the duration of the Excusable Delay.
- 3. However, if an Excusable Delay has continued for fifteen (15) days or more, the Contracting Authority may, by giving notice in writing to the Contractor, terminate the Contract. In such a case, the Parties agree that neither will make any claim against the other for damages, costs, expected profits or any other loss arising out of the termination or the event that contributed to the Excusable Delay. The Contractor agrees to repay immediately to Canada the portion of any advance payment that is unliquidated at the date of the termination.
- 4. Unless Canada has caused the delay by failing to meet an obligation under the Contract, Canada will not be responsible for any costs incurred by the Contractor or any of its subcontractors or agents as a result of an Excusable Delay.
- 5. If the Contract is terminated under this section, the Contracting Authority may require the Contractor to deliver to Canada, in the manner and to the extent directed by the Contracting Authority, any completed parts of the Work not delivered and accepted before the termination and anything that the Contractor has acquired or produced specifically to perform the Contract. Canada will pay the Contractor:
  - (a) the value, of all completed parts of the Work delivered to and accepted by Canada, based on the Contract Price, including the proportionate part of the Contractor's profit or fee included in the Contract Price; and
  - (b) the Cost to the Contractor that Canada considers reasonable in respect of anything else delivered to and accepted by Canada.

The total amount paid by Canada under the Contract to the date of termination and any amounts payable under this subsection must not exceed the Contract Price.

## 2035 10 (2008-05-12) Inspection and Acceptance of the Work

- 1. All the Work is subject to inspection and acceptance by Canada. Inspection and acceptance of the Work by Canada do not relieve the Contractor of its responsibility for defects or other failures to meet the requirements of the Contract. Canada will have the right to reject any Work that is not in accordance with the requirements of the Contract and require its correction or replacement at the Contractor's expense.
- 2. The Contractor must provide representatives of Canada access to all locations where any part of the Work is being performed at any time during working hours. Representatives of Canada may make examinations and such tests of the Work as they may think fit. The Contractor must provide all assistance and facilities, test

pieces, samples and documentation that the representatives of Canada may reasonably require for the carrying out of the inspection. The Contractor must forward such test pieces and samples to such person or location as Canada specifies.

3. The Contractor must inspect and approve any part of the Work before submitting it for acceptance or delivering it to Canada. The Contractor must keep accurate and complete inspection records that must be made available to Canada on request. Representatives of Canada may make copies and take extracts of the records during the performance of the Contract and for up to three (3) years after the end of the Contract.

## 2035 11 (2008-05-12) Invoice Submission

- 1. Invoices must be submitted in the Contractor's name. The Contractor must submit invoices for each delivery or shipment; invoices must only apply to the Contract. Each invoice must indicate whether it covers partial or final delivery.
- 2. Invoices must show:
  - (a) the date, the name and address of the client, item or reference numbers, deliverable and/or description of the Work, contract number, GST/HST number;
  - (b) details of expenditures in accordance with the Basis of Payment, exclusive of Goods and Services Tax (GST) or Harmonized Sales Tax (HST) (such as item, quantity, unit of issue, unit price, fixed time labour rates and level of effort, subcontracts, as applicable);
  - (c) deduction for holdback, if applicable;
  - (d) the extension of the totals, if applicable; and
  - (e) if applicable, the method of shipment together with date, case numbers and part or reference numbers, shipment charges and any other additional charges.
- 3. If applicable, the GST or HST must be specified on all invoices as a separate item. All items that are zero-rated, exempt or to which the GST or HST does not apply, must be identified as such on all invoices.
- 4. By submitting an invoice, the Contractor certifies that the invoice is consistent with the Work delivered and is in accordance with the Contract.

## 2035 12 (2010-08-16) Taxes

1. Municipal Taxes

Municipal Taxes do not apply.

- 2. Provincial Taxes
  - (a) Excluding legislated exceptions, federal government departments and agencies are not required to pay any sales tax payable to the province in which the taxable goods or services are delivered. This exemption has been provided to federal government departments and agencies under the authority of one of the following:
    - Provincial Sales Tax (PST) Exemption Licence Numbers, for the provinces of: Prince Edward Island OP-10000-250 Manitoba 390-516-0
    - (ii) for Quebec, Saskatchewan, the Yukon Territory, the Northwest Territories and Nunavut, an Exemption Certification, which certifies that the goods or services purchased are not subject to the provincial/territorial sales and consumption taxes because they are purchased by the federal government with Canada funds for the use of the federal government.

- (b) Currently, in Alberta, the Yukon Territory, the Northwest Territories and Nunavut, there is no general PST. However, if a PST is introduced in Alberta, the Yukon Territory, the Northwest Territories or Nunavut, the sales tax exemption certificate would be required on the purchasing document.
- (c) Federal departments must pay the HST in the participating provinces of Newfoundland and Labrador, Nova Scotia, New Brunswick, Ontario and British Columbia.
- (d) The Contractor is not exempt from paying PST under the above Exemption Licence Numbers or Exemption Certification. The Contractor must pay the PST on taxable goods or services used or consumed in the performance of the Contract (in accordance with applicable provincial legislation), including material incorporated into real property.
- 3. Changes to Taxes and Duties

If there is any change to any tax or duty payable to any level of government in Canada after the bid submission date that affects the costs of the Work to the Contractor, the Contract Price will be adjusted to reflect the increase or decrease in the cost to the Contractor. However, there will be no adjustment for any change that increases the cost of the Work to the Contractor if public notice of the change was given before bid submission date in sufficient detail to have permitted the Contractor to calculate the effect of the change on its cost. There will be no adjustment if the change takes effect after the date required by the Contract for delivery of the Work.

4. GST or HST

The estimated GST or HST, if applicable, is included in the total estimated cost on page 1 of the Contract. The GST or HST is not included in the Contract Price but will be paid by Canada as provided in the Invoice Submission section above. The Contractor agrees to remit to Canada Revenue Agency any amounts of GST and HST paid or due.

5. Tax Withholding of 15 Percent

Pursuant to the *Income Tax Act*, 1985, c. 1 (5th Supp.) and the *Income Tax Regulations*, Canada must withhold 15 percent of the amount to be paid to the Contractor in respect of services provided in Canada if the Contractor is a non-resident unless the Contractor obtains a valid waiver. The amount withheld will be held on account for the Contractor in respect to any tax liability which may be owed to Canada.

# 2035 13 (2010-01-11) Transportation Costs

If transportation costs are payable by Canada under the Contract and the Contractor makes the transportation arrangements, shipments must be made by the most direct and economical means consistent with normal shipping practice. The costs must be shown as a separate item on the invoice.

## 2035 14 (2010-01-11) Transportation Carriers' Liability

The federal government's policy of underwriting its own risks precludes payment of insurance or valuation charges for transportation beyond the point at which ownership of goods passes to the federal government (determined by the FOB point or Incoterms). Where increased carrier liability is available without charge, the Contractor must obtain the increased liability for shipment.

## 2035 15 (2008-05-12) Payment Period

- 1. Canada's standard payment period is thirty (30) days. The payment period is measured from the date an invoice in acceptable form and content is received in accordance with the Contract or the date the Work is delivered in acceptable condition as required in the Contract, whichever is later. A payment is considered overdue on the 31st day following that date and interest will be paid automatically in accordance with the section 16.
- If the content of the invoice and its substantiating documentation are not in accordance with the Contract or the Work is not in acceptable condition, Canada will notify the Contractor within fifteen (15) days of receipt. The 30-day payment period begins upon receipt of the revised invoice or the replacement or corrected Work.

Failure by Canada to notify the Contractor within fifteen (15) days will only result in the date specified in subsection 1 to apply for the sole purpose of calculating interest on overdue accounts.

## 2035 16 (2008-12-12) Interest on Overdue Accounts

1. For the purpose of this section:

"Average Rate" means the simple arithmetic mean of the Bank Rates in effect at 4:00 p.m. Eastern Time each day during the calendar month immediately before the calendar month in which payment is made;

"Bank Rate" means the rate of interest established from time to time by the Bank of Canada as the minimum rate at which the Bank of Canada makes short term advances to members of the Canadian Payments Association;

"date of payment" means the date of the negotiable instrument drawn by the Receiver General for Canada to pay any amount under the Contract;

an amount becomes "overdue" when it is unpaid on the first day following the day on which it is due and payable according to the Contract.

- 2. Canada will pay to the Contractor simple interest at the Average Rate plus 3 percent per year on any amount that is overdue, from the date that amount becomes overdue until the day before the date of payment, inclusive. The Contractor is not required to provide notice to Canada for interest to be payable.
- 3. Canada will pay interest in accordance with this section only if Canada is responsible for the delay in paying the Contractor. Canada will not pay interest on overdue advance payments.

#### 2035 17 (2008-05-12) Compliance with Applicable Laws

- 1. The Contractor must comply with all laws applicable to the performance of the Contract. The Contractor must provide evidence of compliance with such laws to Canada at such times as Canada may reasonably request.
- 2. The Contractor must obtain and maintain at its own cost all permits, licenses, regulatory approvals and certificates required to perform the Work. If requested by the Contracting Authority, the Contractor must provide a copy of any required permit, license, regulatory approvals or certificate to Canada.

#### 2035 18 (2008-05-12) Ownership

- 1. Unless provided otherwise in the Contract, the Work or any part of the Work belongs to Canada after delivery and acceptance by or on behalf of Canada.
- 2. However if any payment is made to the Contractor for or on account of any Work, either by way of progress or milestone payments, that work paid for by Canada belongs to Canada upon such payment being made. This transfer of ownership does not constitute acceptance by Canada of the Work or any part of the Work and does not relieve the Contractor of its obligation to perform the Work in accordance with the Contract.
- Despite any transfer of ownership, the Contractor is responsible for any loss or damage to the Work or any part
  of the Work until it is delivered to Canada in accordance with the Contract. Even after delivery, the Contractor
  remains responsible for any loss or damage to any part of the Work caused by the Contractor or any
  subcontractor.
- 4. Upon transfer of ownership to the Work or any part of the Work to Canada, the Contractor must, if requested by Canada, establish to Canada's satisfaction that the title is free and clear of all claims, liens, attachments, charges or encumbrances. The Contractor must execute any conveyances and other instruments necessary to perfect the title that Canada may require.

In this section, "Material" means anything that is created by the Contractor as part of the Work under the Contract, that is required by the Contract to be delivered to Canada and in which copyright subsists. "Material" does not include anything created by the Contractor before the date of the Contract.

Copyright in the Material belongs to Canada and the Contractor must include the copyright symbol and either of the following notice on the Material: © Her Majesty the Queen in right of Canada (year) or © Sa Majesté la Reine du chef du Canada (année).

The Contractor must not use, copy, divulge or publish any Material except as is necessary to perform the Contract. The Contractor must execute any conveyance and other documents relating to copyright in the Material as Canada may require.

The Contractor must provide at the request of Canada a written permanent waiver of moral rights, in a form acceptable to Canada, from every author that contributed to the Material. If the Contractor is the author of the Material, the Contractor permanently waives its moral rights in the Material.

## 2035 20 (2008-05-12) Translation of Documentation

The Contractor agrees that Canada may translate in the other official language any documentation delivered to Canada by the Contractor that does not belong to Canada under section 20. The Contractor acknowledges that Canada owns the translation and that it is under no obligation to provide any translation to the Contractor. Canada agrees that any translation must include any copyright notice and any proprietary right notice that was part of the original. Canada acknowledges that the Contractor is not responsible for any technical errors or other problems that may arise as a result of the translation.

## 2035 21 (2008-05-12) Confidentiality

- 1. The Contractor must keep confidential all information provided to the Contractor by or on behalf of Canada in connection with the Work, including any information that is confidential or proprietary to third parties, and all information conceived, developed or produced by the Contractor as part of the Work when copyright or any other intellectual property rights in such information belongs to Canada under the Contract. The Contractor must not disclose any such information without the written permission of Canada. The Contractor may disclose to a subcontractor any information necessary to perform the subcontract as long as the subcontractor agrees to keep the information confidential and that it will be used only to perform the subcontract.
- 2. The Contractor agrees to use any information provided to the Contractor by or on behalf of Canada only for the purpose of the Contract. The Contractor acknowledges that all this information remains the property of Canada or the third party, as the case may be. Unless provided otherwise in the Contract, the Contractor must deliver to Canada all such information, together with every copy, draft, working paper and note that contains such information, upon completion or termination of the Contract or at such earlier time as Canada may require.
- 3. Subject to the Access to Information Act, R.S., 1985, c. A-1, and to any right of Canada under the Contract to release or disclose, Canada must not release or disclose outside the Government of Canada any information delivered to Canada under the Contract that is proprietary to the Contractor or a subcontractor.
- 4. The obligations of the Parties set out in this section do not apply to any information if the information:
  - (a) is publicly available from a source other than the other Party; or
  - (b) is or becomes known to a Party from a source other than the other Party, except any source that is known to be under an obligation to the other Party not to disclose the information; or
  - (c) is developed by a Party without use of the information of the other Party.
- 5. Wherever possible, the Contractor must mark or identify any proprietary information delivered to Canada under the Contract as "Property of (Contractor's name), permitted Government uses defined under National Research Council Canada (NRC) Contract No. (fill in Contract Number)". Canada will not be liable for any unauthorized use or disclosure of information that could have been so marked or identified and was not.

- 6. If the Contract, the Work, or any information referred to in subsection 1 is identified as TOP SECRET, SECRET, CONFIDENTIAL, or PROTECTED by Canada, the Contractor must at all times take all measures reasonably necessary for the safeguarding of the material so identified, including those set out in the PWGSC Industrial Security Manual and its supplements and any other instructions issued by Canada.
- 7. If the Contract, the Work, or any information referred to in subsection 1 is identified as TOP SECRET, SECRET, CONFIDENTIAL, or PROTECTED, by Canada, representatives of Canada are entitled to inspect the Contractor's premises and the premises of a subcontractor at any tier for security purposes at any time during the term of the Contract. The Contractor must comply with, and ensure that any subcontractor complies with, all written instructions issued by Canada dealing with the material so identified, including any requirement that employees of the Contractor or of any subcontractor execute and deliver declarations relating to reliability screenings, security clearances and other procedures.
- The Contractor consents in the case of a contract that has a value in excess of \$10,000.00 to the public disclosure of information – other than information described in any of paragraphs 20(1)a) to (d) of the Access to Information Act – relating to the contract.

# 2035 22 (2008-05-12) Government Property

- 1. All Government Property must be used by the Contractor solely for the purpose of the Contract and remains the property of Canada. The Contractor must maintain adequate accounting records of all Government Property and, whenever feasible, mark it as being the property of Canada.
- 2. The Contractor must take reasonable and proper care of all Government Property while it is in its possession or subject to its control. The Contractor is responsible for any loss or damage resulting from its failure to do so other than loss or damage caused by ordinary wear and tear.
- 3. All Government Property, unless it is installed or incorporated in the Work, must be returned to Canada on demand. All scrap and all waste materials, articles or things that are Government Property must, unless provided otherwise in the Contract, remain the property of Canada and must be disposed of only as directed by Canada.
- 4. At the time of completion of the Contract, and if requested by the Contracting Authority, the Contractor must provide to Canada an inventory of all Government Property relating to the Contract.

# 2035 23 (2008-05-12) Liability

The Contractor is liable for any damage caused by the Contractor, its employees, subcontractors, or agents to Canada or any third party. Canada is liable for any damage caused by Canada, its employees or agents to the Contractor or any third party. The Parties agree that no limitation of liability or indemnity provision applies to the Contract unless it is specifically incorporated in full text in the Articles of Agreement. Damage includes any injury to persons (including injury resulting in death) or loss of or damage to property (including real property) caused as a result of or during the performance of the Contract.

## 2035 24 (2008-05-12) Intellectual Property Infringement and Royalties

- 1. The Contractor represents and warrants that, to the best of its knowledge, neither it nor Canada will infringe any third party's intellectual property rights in performing or using the Work, and that Canada will have no obligation to pay royalties of any kind to anyone in connection with the Work.
- 2. If anyone makes a claim against Canada or the Contractor concerning intellectual property infringement or royalties related to the Work, that Party agrees to notify the other Party in writing immediately. If anyone brings a claim against Canada, according to *Department of Justice Act*, R.S., 1985, c. J-2, the Attorney General of Canada must have the regulation and conduct of all litigation for or against Canada, but the Attorney General may request that the Contractor defend Canada against the claim. In either case, the Contractor agrees to

participate fully in the defence and any settlement negotiations and to pay all costs, damages and legal costs incurred or payable as a result of the claim, including the amount of any settlement. Both Parties agree not to settle any claim unless the other Party first approves the settlement in writing.

- 3. The Contractor has no obligation regarding claims that were only made because:
  - (a) Canada modified the Work or part of the Work without the Contractor's consent or used the Work or part of the Work without following a requirement of the Contract; or
  - (b) Canada used the Work or part of the Work with a product that the Contractor did not supply under the Contract (unless that use is described in the Contract or the manufacturer's specifications); or
  - (c) the Contractor used equipment, drawings, specifications or other information supplied to the Contractor by Canada (or by someone authorized by Canada); or
  - (d) the Contractor used a specific item of equipment or software that it obtained because of specific instructions from the Contracting Authority; however, this exception only applies if the Contractor has included the following language in its own contract with the supplier of that equipment or software:
     "[Supplier name] acknowledges that the purchased items will be used by the Government of Canada. If a third party claims that equipment or software supplied under this contract infringes any intellectual property right, [supplier name], if requested to do so by either [Contractor name] or Canada, will defend both [Contractor name] and Canada against that claim at its own expense and will pay all costs, damages and legal fees payable as a result of that infringement. "Obtaining this protection from the supplier is the Contractor's responsibility and, if the Contractor does not do so, it will be responsible to Canada for the claim.
- 4. If anyone claims that, as a result of the Work, the Contractor or Canada is infringing its intellectual property rights, the Contractor must immediately do one of the following:
  - (a) take whatever steps are necessary to allow Canada to continue to use the allegedly infringing part of the Work; or
  - (b) modify or replace the Work to avoid intellectual property infringement, while ensuring that the Work continues to meet all the requirements of the Contract; or
  - (c) take back the Work and refund any part of the Contract Price that Canada has already paid.

If the Contractor determines that none of these alternatives can reasonably be achieved, or if the Contractor fails to take any of these steps within a reasonable amount of time, Canada may choose either to require the Contractor to do (c), or to take whatever steps are necessary to acquire the rights to use the allegedly infringing part(s) of the Work itself, in which case the Contractor must reimburse Canada for all the costs it incurs to do so.

#### 2035 25 (2008-05-12) Amendment and Waivers

- 1. To be effective, any amendment to the Contract must be done in writing by the Contracting Authority and the authorized representative of the Contractor.
- While the Contractor may discuss any proposed modifications to the Work with other representatives of Canada, Canada will not be responsible for the cost of any modification unless it has been incorporated into the Contract in accordance with subsection 1.
- 3. A waiver will only be valid, binding or affect the rights of the Parties if it is made in writing by, in the case of a waiver by Canada, the Contracting Authority and, in the case of a waiver by the Contractor, the authorized representative of the Contractor.
- 4. The waiver by a Party of a breach of any condition of the Contract will not be treated or interpreted as a waiver of any subsequent breach and therefore will not prevent that Party from enforcing of that term or condition in the case of a subsequent breach.

## 2035 26 (2008-05-12) Assignment

- 1. The Contractor must not assign the Contract without first obtaining the written consent of the Contracting Authority. Any assignment made without that consent is void and will have no effect. The assignment will be effective upon execution of an assignment agreement signed by the Parties and the assignee.
- 2. Assignment of the Contract does not relieve the Contractor from any obligation under the Contract and it does not impose any liability upon Canada.

#### 2035 27 (2008-05-12) Suspension of the Work

- The Contracting Authority may at any time, by written notice, order the Contractor to suspend or stop the Work or part of the Work under the Contract for a period of up to one hundred eighty (180) days. The Contractor must immediately comply with any such order in a way that minimizes the cost of doing so. While such an order is in effect, the Contractor must not remove any part of the Work from any premises without first obtaining the written consent of the Contracting Authority. Within these one hundred eighty (180) days, the Contracting Authority must either cancel the order or terminate the Contract, in whole or in part, under section 28 or section 29.
- 2. When an order is made under subsection 1, unless the Contracting Authority terminates the Contract by reason of default by the Contractor or the Contractor abandons the Contract, the Contractor will be entitled to be paid its additional costs incurred as a result of the suspension plus a fair and reasonable profit.
- 3. When an order made under subsection 1 is cancelled, the Contractor must resume work in accordance with the Contract as soon as practicable. If the suspension has affected the Contractor's ability to meet any delivery date under the Contract, the date for performing the part of the Work affected by the suspension will be extended for a period equal to the period of suspension plus a period, if any, that in the opinion of the Contracting Authority, following consultation with the Contractor, is necessary for the Contractor to resume the Work. Any equitable adjustments will be made as necessary to any affected conditions of the Contract.

#### 2035 28 (2008-05-12) Default by the Contractor

- 1. If the Contractor is in default in carrying out any of its obligations under the Contract, the Contracting Authority may, by giving written notice to the Contractor, terminate for default the Contract or part of the Contract. The termination will take effect immediately or at the expiration of a cure period specified in the notice, if the Contractor has not cured the default to the satisfaction of the Contracting Authority within that cure period.
- 2. If the Contractor becomes bankrupt or insolvent, makes an assignment for the benefit of creditors, or takes the benefit of any statute relating to bankrupt or insolvent debtors, or if a receiver is appointed under a debt instrument or a receiving order is made against the Contractor, or an order is made or a resolution passed for the dissolution, liquidation or winding-up of the Contractor, the Contracting Authority may, to the extent permitted by the laws of Canada, by giving written notice to the Contractor, immediately terminate for default the Contract or part of the Contract.
- 3. If Canada gives notice under subsection 1 or 2, the Contractor will have no claim for further payment except as provided in this section. The Contractor will be liable to Canada for all losses and damages suffered by Canada because of the default or occurrence upon which the notice was based, including any increase in the cost incurred by Canada in procuring the Work from another source. The Contractor agrees to repay immediately to Canada the portion of any advance payment that is unliquidated at the date of the termination.
- 4. Upon termination of the Contract under this section, the Contracting Authority may require the Contractor to deliver to Canada, in the manner and to the extent directed by the Contracting Authority, any completed parts of the Work, not delivered and accepted before the termination and anything the Contractor has acquired or produced specifically to perform the Contract. In such a case, subject to the deduction of any claim that Canada may have against the Contractor arising under the Contract or out of the termination, Canada will pay or credit to the Contractor:
  - (a) the value, of all completed parts of the Work delivered to and accepted by Canada, based on the Contract Price, including the proportionate part of the Contractor's profit or fee included in the Contract Price; and

(b) the cost to the Contractor that Canada considers reasonable in respect of anything else delivered to and accepted by Canada.

The total amount paid by Canada under the Contract to the date of the termination and any amount payable under this subsection must not exceed the Contract Price.

- 5. Title to everything for which payment is made to the Contractor will, once payment is made, pass to Canada unless it already belongs to Canada under any other provision of the Contract.
- 6. If the Contract is terminated for default under subsection 1, but it is later determined that grounds did not exist for a termination for default, the notice will be considered a notice of termination for convenience issued under subsection 1 of section 29.

## 2035 29 (2008-05-12) Termination for Convenience

- At any time before the completion of the Work, the Contracting Authority may, by giving notice in writing to the Contractor, terminate for convenience the Contract or part of the Contract. Once such a notice of termination for convenience is given, the Contractor must comply with the requirements of the termination notice. If the Contract is terminated in part only, the Contractor must proceed to complete any part of the Work that is not affected by the termination notice. The termination will take effect immediately or, as the case may be, at the time specified in the termination notice.
- 2. If a termination notice is given pursuant to subsection 1, the Contractor will be entitled to be paid, for costs that have been reasonably and properly incurred to perform the Contract to the extent that the Contractor has not already been paid or reimbursed by Canada. The Contractor will be paid:
  - (a) on the basis of the Contract Price, for all completed work that is inspected and accepted in accordance with the Contract, whether completed before, or after the termination in accordance with the instructions contained in the termination notice;
  - (b) the Cost to the Contractor plus a fair and reasonable profit for all work terminated by the termination notice before completion; and
  - (c) all costs incidental to the termination of the Work incurred by the Contractor but not including the cost of severance payments or damages to employees whose services are no longer required, except wages that the Contractor is obligated by statute to pay.
- 3. Canada may reduce the payment in respect of any part of the Work, if upon inspection, it does not meet the requirements of the Contract.
- 4. The total of the amounts, to which the Contractor is entitled to be paid under this section, together with any amounts paid, due or becoming due to the Contractor must not exceed the Contract Price. The Contractor will have no claim for damages, compensation, loss of profit, allowance arising out of any termination notice given by Canada under this section except to the extent that this section expressly provides. The Contractor agrees to repay immediately to Canada the portion of any advance payment that is unliquidated at the date of the termination.

## 2035 30 (2008-05-12) Accounts and Audit

- The Contractor must keep proper accounts and records of the cost of performing the Work and of all expenditures or commitments made by the Contractor in connection with the Work, including all invoices, receipts and vouchers. The Contractor must retain records, including bills of lading and other evidence of transportation or delivery, for all deliveries made under the Contract.
- 2. If the Contract includes payment for time spent by the Contractor, its employees, representatives, agents or subcontractors performing the Work, the Contractor must keep a record of the actual time spent each day by each individual performing any part of the Work.

- 3. Unless Canada has consented in writing to its disposal, the Contractor must retain all the information described in this section for six (6) years after it receives the final payment under the Contract, or until the settlement of all outstanding claims and disputes, whichever is later. During this time, the Contractor must make this information available for audit, inspection and examination by the representatives of Canada, who may make copies and take extracts. The Contractor must provide all reasonably required facilities for any audit and inspection and must furnish all the information as the representatives of Canada may from time to time require to perform a complete audit of the Contract.
- 4. The amount claimed under the contract, calculated in accordance with the Basis of Payment provision in the Articles of Agreement, is subject to government audit both before and after payment is made. If an audit is performed after payment, the Contractor agrees to repay any overpayment immediately on demand by Canada. Canada may hold back, deduct and set off any credits owing and unpaid under this section from any money that Canada owes to the Contractor at any time (including under other contracts). If Canada does not choose to exercise this right at any given time, Canada does not lose this right.

# 2035 31 (2008-05-12) Right of Set-off

Without restricting any right of set-off given by law, Canada may set-off against any amount payable to the Contractor under the Contract, any amount payable to Canada by the Contractor under the Contract or under any other current contract. Canada may, when making a payment pursuant to the Contract, deduct from the amount payable to the Contractor any such amount payable to Canada by the Contractor which, by virtue of the right of set-off, may be retained by Canada.

## 2035 32 (2008-05-12) Notice

Any notice under the Contract must be in writing and may be delivered by and, courier, mail, facsimile or other electronic method that provides a paper record of the text of the notice. It must be sent to the Party for whom it is intended at the address stated in the Contract. Any notice will be effective on the day it is received at that address. Any notice to Canada must be delivered to the Contracting Authority.

## 2035 33 (2008-05-12) Conflict of Interest and Values and Ethics Codes for the Public Service

The Contractor acknowledges that individuals who are subject to the provisions of the *Conflict of Interest Act*, 2006, c. 9, s. 2, the Conflict of Interest Code for Members of the House of Commons, the Values and Ethics Code for the Public Service or all other codes of values and ethics applicable within specific organizations cannot derive any direct benefit resulting from the Contract.

## 2035 34 (2008-05-12) No Bribe or Conflict

- 1. The Contractor declares that no bribe, gift, benefit, or other Inducement has been or will be paid, given, promised or offered directly or indirectly to any official or employee of Canada or to a member of the family of such a person, with a view to influencing the entry into the Contract or the administration of the Contract.
- 2. The Contractor must not influence, seek to influence or otherwise take part in a decision of Canada knowing that the decision might further its private interest. The Contractor must have no financial interest in the business of a third party that causes or would appear to cause a conflict of interest in connection with the performance of its obligations under the Contract. If such a financial interest is acquired during the period of the Contract, the Contractor must immediately declare it to the Contracting Authority.
- 3. The Contractor warrants that, to the best of its knowledge after making diligent inquiry, no conflict exists or is likely to arise in the performance of the Contract. In the event the Contractor becomes aware of any matter that causes or is likely to cause a conflict in relation to the Contractor's performance under the Contract, the Contractor must immediately disclose such matter to the Contracting Authority in writing.
- 4. If the Contracting Authority is of the opinion that a conflict exists as a result of the Contractor's disclosure or as a result of any other information brought to the Contracting Authority's attention, the Contracting Authority may require the Contractor to take steps to resolve or otherwise deal with the conflict or, at its entire discretion, terminate the Contract for default. Conflict means any matter, circumstance, interest, or activity affecting the

Contractor, its personnel or subcontractors, which may or may appear to impair the ability of the Contractor to perform the Work diligently and independently.

## 2035 35 (2008-05-12) Survival

All the Parties' obligations of confidentiality, representations and warranties set out in the Contract as well as the provisions, which by the nature of the rights or obligations might reasonably be expected to survive, will survive the expiry or termination of the Contract.

#### 2035 36 (2008-05-12) Severability

If any provision of the Contract is declared by a court of competent jurisdiction to be invalid, illegal or unenforceable, that provision will be removed from the Contract without affecting any other provision of the Contract.

#### 2035 37 (2008-05-12) Successors and Assigns

The Contract is to the benefit of and binds the successors and permitted assignees of Canada and of the Contractor.

#### 2035 38 (2008-12-12) Contingency Fees

The Contractor certifies that it has not directly or indirectly, paid or agreed to pay and agrees that it will not, directly or indirectly, pay a contingency fee for the solicitation, negotiation or obtaining of the Contract to any person, other than an employee of the Contractor acting in the normal course of the employee's duties. In this section, "contingency fee" means any payment or other compensation that depends or is calculated based on a degree of success in soliciting, negotiating or obtaining the Contract and "person" includes any individual who is required to file a return with the registrar pursuant to section 5 of the *Lobbying Act*, 1985, c. 44 (4th Supplement).

#### 2035 39 (2010-01-11) International Sanctions

- Persons in Canada, and Canadians outside of Canada, are bound by economic sanctions imposed by Canada. As a result, the Government of Canada cannot accept delivery of goods or services that originate, either directly or indirectly, from the countries or persons subject to <u>economic sanctions</u>.
- 2. The Contractor must not supply to the Government of Canada any goods or services which are subject to economic sanctions.
- 3. The Contractor must comply with changes to the regulations imposed during the period of the Contract. The Contractor must immediately advise Canada if it is unable to perform the Work as a result of the imposition of economic sanctions against a country or person or the addition of a good or service to the list of sanctioned goods or services. If the Parties cannot agree on a work around plan, the Contract will be terminated for the convenience of Canada in accordance with section 29.

#### 2035 40 (2008-05-12) Harassment in the Workplace

- 1. The Contractor acknowledges the responsibility of Canada to ensure, for its employees, a healthy work environment, free of harassment. A copy of the <u>Policy on the Prevention and Resolution of Harassment in the Workplace</u>, which is also applicable to the Contractor, is available on the Treasury Board Web site.
- 2. The Contractor must not, either as an individual, or as a corporate or unincorporated entity, through its employees or subcontractors, harass, abuse, threaten, discriminate against or intimidate any employee, contractor or other individual employed by, or under contract with Canada. The Contractor will be advised in writing of any complaint and will have the right to respond in writing. Upon receipt of the Contractor's response, the Contracting Authority will, at its entire discretion, determine if the complaint is founded and decide on any action to be taken.

The Contract constitutes the entire and only agreement between the Parties and supersedes all previous negotiations, communications and other agreements, whether written or oral, unless they are incorporated by reference in the Contract. There are no terms, covenants, representations, statements or conditions binding on the Parties other than those contained in the Contract.