

# Valentin Joly

Molecular Biologist • Bioinformatician

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valentinjoly

valentinjoly

## Education

**Ph.D. Biological Sciences, 2013–present** (thesis to be submitted in Dec. 2018)

**M.Sc. Biological Sciences, 2012** (accelerated transition to Ph.D. in 2013)

University of Montreal, *Montreal, QC, Canada*

**Thesis:** Molecular communication between male and female gametophytes and reproductive barriers in wild potatoes (*Solanum* sect. *Petota*).

**Advisor:** Prof. Daniel P. Matton

**B.Sc. Biology, international program, 2011**

Pierre & Marie Curie University (UPMC), *Paris, France*: years 1 and 2

University of Montreal (UdeM), *Montreal, QC, Canada*: year 3

## Research experience

🔬 Molecular biology </> Bioinformatics

- Canada** | **Ph.D. Project, 2013–present.** Prof. D. P. Matton, University of Montreal.
- 🔬 DNA/RNA techniques. Cloning. Protein expression and purification.
  - 🔬 Plant cell culture. Pollen tube guidance assays. Microfluidics.
  - 🔬 Microscopy: epifluorescence, confocal, SEM, TEM.
  - </> Python and R programming. Development of the sequence search tool KAPPA.
  - </> Transcriptomics: RNA-seq assemblies. Microarray analysis. DGE. Annotation.
  - </> Proteomics: LC-MS data analysis. Secretomics. Label-free protein quantification.
- Sweden** | **International collaboration, 2016–present.** Dr. Johan Edqvist, Linköping University.
- 🔬 Protein expression and purification in *Pichia pastoris*.
  - </> Development of a nsLTP prediction tool and a plant nsLTP database.
- Japan** | **JSPS Summer Program, June–Aug. 2016.** Prof. T. Higashiyama, Nagoya University.
- 🔬 Development of microfluidic devices for pollen tube guidance assays.
  - 🔬 Introduction to 2-photon confocal microscopy.
- USA** | **International internship, Apr.–May 2014.** Prof. W. J. Swanson, University of Washington.
- </> Variant calling (GATK).
  - </> Molecular evolution and positive selection analysis (codeml).
- Argentina** | **Botanical transect, Apr.–May 2012.** Dr. F. Chiarini, Universidad Nacional de Córdoba.
- 🔬 Collection of potato individuals in the Andes cordillera.

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## Research experience (continued)

⚠ Molecular biology </> Bioinformatics

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|--------|---|
| Canada | <b>Summer internship</b> , Jan.–Aug. 2011. Prof. D. P. Matton, University of Montreal.<br>⚠ Molecular cloning. Biolistics. Epifluorescence and confocal microscopy. |
| France | <b>Undergraduate summer internship</b> , Jul.–Jun. 2010. Prof. C. Bailly, CNRS/UPMC, Paris.<br>⚠ Seed dormancy and germination biology.                             |
|        | <b>Short-term introductory internship</b> , Jan. 2009. Prof. C. Bowler, CNRS/ENS, Paris.<br>⚠ Protein electrophoresis. Immunoprecipitation. Western Blotting.       |

## Extra training

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|---------------------|--|
| Bioinformatics      | <b>Online Bioinformatics Specialization</b> , 2016–2018 UC San Diego, on Coursera<br>• 6 different courses and a final project: Certificate <a href="#">H528Q2K9KYB6</a>   |
| Python/R            | <b>Online Courses in Bioinformatics</b> , 2016 Johns Hopkins University, on Coursera<br>• <i>Python for Genomic Data Science</i> : Certificate <a href="#">XHKWDB4XD7</a><br>• <i>Introduction to Genomic Technologies</i> : Certificate <a href="#">U88T89XKR2</a><br>• <i>R Programming</i> : Certificate <a href="#">X8NKEQAUU4</a> |
| Sequence annotation | <b>International seminar in automated functional protein annotation</b> , 2012<br>BLAST2GO, University of California, Davis, CA, USA   |

## Publications

\*Equal contributions

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|----------------|--|
| Published      | <p>Salminen TA, Eklund DM, <b>Joly V</b>, Blomqvist K, Matton DP and Edqvist J. (2018). Deciphering the evolution and development of the cuticle by studying lipid transfer proteins in mosses and liverworts. <i>Plants</i>, 7(1), 6. DOI: <a href="#">10.3390/plants7010006</a></p> <p><b>Joly V</b> and Matton DP. (2015). KAPPA, a simple algorithm for discovery and clustering of proteins defined by a key amino acid pattern. <i>Bioinformatics</i>, 31(11), 1716–1723. DOI: <a href="#">10.1093/bioinformatics/btv047</a></p> <p>Liu Y*, <b>Joly V*</b>, Dorion S, Rivoal J and Matton DP. (2015). The plant ovule secretome: a different view toward pollen-pistil interactions. <i>Journal of Proteome Research</i>, 14(11):4763–75. DOI: <a href="#">10.1021/acs.jproteome.5b00618</a></p> <p>Lafleur É*, Kapfer C*, <b>Joly V</b>, Liu Y, Tebbji F et coll. (2015). The ScFRK1 MAPK kinase kinase (MAPKKK) from <i>Solanum chacoense</i> is involved in embryo sac and pollen development. <i>Journal of Experimental Botany</i>, 66(7), 1833–1843. DOI: <a href="#">10.1093/jxb/eru524</a></p> |
| In preparation | <p><b>Joly V*</b>, Liu Y* and Matton DP. (2018). <i>Solanum chacoense</i> ovule transcriptome reveals developmentally regulated transcripts during female gametophyte genesis and maturation. To be submitted in Aug. 2018.</p> <p><b>Joly V*</b>, Tebbji F*, Nantel A and Matton DP. (2018). Pollination type recognition from a distance by the ovary is revealed by a global transcriptomic analysis. To be submitted in Aug. 2018.</p>   |

## Oral presentations

★ Award

- 2017 | ★ **Joly V**, Viallet C, Liu Y, Zaro A, Ceriotti F and Matton DP. *Deciphering species-specific pollen tube guidance in Solanum*. CSPB Eastern Regional Meeting, Montreal, QC, Canada, Nov. 24th–25th 2017.  
**Joly V**, Viallet C, Liu Y and Matton DP. *Reproductive cysteine-rich proteins: key players in Solanum speciation?* Plant Biology 2017, Honolulu, HI, USA, June 23rd–28th 2017.
- 2016 | **Joly V** and Matton DP. *Deciphering potatoes' words of love*. Invited speaker, Institute for Transformative bio-Molecules (ITbM), Nagoya University, Japan, July 13th 2016.
- 2015 | ★ **Joly V** and Matton DP. *Plants' secret words of love: rapid evolution of pollen–pistil recognition proteins drives reproductive isolation of wild potatoes*. Botany 2015, Edmonton, AB, Canada, July 26th–29th 2015.  
**Joly V** and Matton DP. *Sex among wild potatoes: ladies wear the pants*. Invited speaker, Centre for Structural and Functional Genomics, Concordia University, Montreal, QC, Canada, July 16th 2015.
- 2014 | **Joly V** and Matton DP. *Cell-cell communication between gametophytes and reproductive isolation in wild potatoes*. Invited speaker, Dept. of Genome Sciences, University of Washington, Seattle, WA, USA, Apr. 24th 2014.
- 2013 | ★ **Joly V** and Matton DP. *Comment éviter les liaisons dangereuses : secrets d'alcôve des pommes de terre*. Journées du Centre SÈVE, Wendake, QC, Canada, Nov. 7th–8th 2013.  
**Joly V** and Matton DP. *Species-specificity of pollen-pistil interactions in wild potatoes*. Invited speaker, Institute of Genetics, Chinese Academy of Science, Beijing, China, Oct. 24th 2013.  
★ **Joly V**, Liu Y and Matton DP. *Divergence des protéines reproductives et maintien des barrières de spéciation chez les pommes de terre sauvages*. 23<sup>e</sup> Symposium des Sciences biologiques, University of Montreal, Montreal, QC, Canada, Mar. 21st 2013.

## Poster presentations

★ Award

- 2018 | **Joly V** and Matton DP. *Long-distance relationships: how the ovary perceives different pollination types at a distance*. Plant Biology 2018, Montreal, QC, Canada, July 14th–18th 2018.
- 2016 | ★ **Joly V**, Liu Y, Dorion S, Rivoal J and Matton DP. *Ovule secretomics reveal the importance of post-transcriptional regulation of reproductive proteins*. Plant Reproduction 2016, Tucson, AZ, USA, March 18th–23rd 2016.  
★ **Joly V** and Matton DP. *KAPPA: exploring -omics data to detect and cluster cysteine-rich proteins*. [same conference as above]
- 2015 | ★ **Joly V** and Matton DP. *KAPPA: meeting the challenge of proteome-wide detection and clustering of cysteine-rich proteins*. High Performance Computing Symposium HPCS 2015, Montreal, QC, Canada, June 17th–19th 2015.
- 2013 | **Joly V**, Liu Y and Matton DP. *Interspecific divergence of reproductive proteins: the keystone of species-specific fertilization in wild potatoes?* 10th Solanaceae Conference (SOL 2013), Beijing, China, Oct. 13th–17th 2013.  
**Joly V** and Matton DP. *Speciation genes in pollen-pistil interactions*. 9th Canadian Plant Genomics Workshop, Halifax, NS, Canada, Aug. 12th–15th 2013.

## Other presentations

\*Presenter

- 2018 | **Joly V** and Matton DP\*. *Pre-zygotic barriers in inter-specific crosses: a leading role for small cysteine-rich protein attractant in wild potatoes species ?* Plant Biology 2018, Montreal, QC, Canada, July 14th-18th 2018.
- 2017 | **Joly V** and Matton DP\*. *Pollination type recognition from a distance by the ovary is revealed by a global transcriptomic analysis.* 5th International Symposium on Plant Signaling and Behavior, Matsue, Japan, June 26th – July 1st 2017.
- 2013 | Tebbji F, **Joly V** and Matton DP\*. *Pollination type recognition from a distance by the ovary is revealed by a global transcriptomic analysis.* 10th Solanaceae Conference (SOL 2013), Beijing, China, Oct. 13th–17th 2013.  
Liu Y\*, Bai F, **Joly V** and Matton DP. *Identification of female gametophyte-specific CRPs and isolation of pollen tube guidance attractant(s) in solanaceous species.* Journées du Centre SÈVE, Wendake, QC, Canada, Nov. 7th–8th 2013.  
Liu Y\*, **Joly V** and Matton DP. *Isolation and characterization of the pollen tube attractant from Solanum chacoense.* 10th Solanaceae Conference (SOL 2013), Beijing, China, Oct. 13th–17th 2013.
- 2011 | Daigle C\*, **Joly V** and Matton DP. *Discovering new MAPK signalling cascades involved in plant reproduction using co-expression analyses and deep transcriptomic sequencing of ovule and pollen tubes.* 7th Canadian Plant Genomics Workshop, Niagara Falls, ON, Canada, Aug. 22nd–25th 2011.

## Teaching

Plant physiology	<p><b>Chief teaching assistant, 2013–present</b>  <b>Teaching assistant, 2011–2012</b>            Plant physiology labs, Prof. Jean Rivoal, University of Montreal</p> <ul style="list-style-type: none"> <li>• Teaching load: 140 hours per session, about 70 students</li> <li>• Weekly courses including a lecture (0:45) and a practical session (2:30)</li> <li>• Supervision of 1–2 teaching assistants</li> </ul>
Molecular biology	<p><b>Teaching assistant, 2014–2016</b>            Molecular biology labs, Prof. D. P. Matton, University of Montreal</p> <ul style="list-style-type: none"> <li>• Teaching load: 110 hours per session, 10–20 students</li> </ul>
Supervision	<p><b>Supervisor for international graduate interns, 2015–present</b>            ELAP (<i>Emerging Leaders in the Americas Program</i>) at the University of Montreal</p> <ul style="list-style-type: none"> <li>• 4 Ph.D./M.Sc. students supervised so far, for 6-month internships</li> </ul> <p><b>Supervisor for undergraduate summer interns, 2012–present</b>            Summer course “Initiation to research” (BIO2091), University of Montreal</p> <ul style="list-style-type: none"> <li>• 6 undergraduate interns supervised so far, for 1 to 4-month projects</li> </ul>

## Scholarships and Awards

★ Major scholarship

- 2017
- ★ **Hydro-Québec Excellence Scholarship**  
Hydro-Québec (national electricity company), \$25,000
  - Scholarship for Finishing Ph.D. Students (BEFD)**  
Faculty of Graduate and Postdoctoral Studies, University of Montreal, \$8,400
  - Jacques-Rousseau Travel Scholarship**  
Plant Biology Research Institute, University of Montreal, \$1,500
  - Travel Scholarship** (*Bourse d'appui à la diffusion des résultats de recherche*)  
Faculty of Graduate and Postdoctoral Studies, University of Montreal, \$500
  - Honorable mention** for a student oral presentation  
CSPB Eastern Regional Meeting
- 2016
- ★ **Hydro-Québec Excellence Scholarship**  
Hydro-Québec (national electricity company), \$25,000
  - ★ **MITACS Globalink Award / JSPS Summer Program**  
MITACS/Japanese Society for the Promotion of Science, ¥550,000
  - ★ **Ph.D. Scholarship from the Government of Québec**  
Fonds Québécois de Recherche – Nature et Technologies, \$13,333
  - Best Graduate Student Poster Award**  
Frontiers in Plant Reproduction Biology, *Plant Reproduction 2016* Conference, \$300
  - Jacques-Rousseau Travel Scholarship**  
Plant Biology Research Institute, University of Montreal, \$1,500
  - PARSECS Travel Scholarship**  
FAÉCUM, University of Montreal, \$400
- 2015
- ★ **Catherine-Frédette Excellence Scholarship in Biological Sciences and Neurology**  
Faculty of Graduate and Postdoctoral Studies, University of Montreal, \$5,000
  - FBSB Ph.D. Scholarship from the Dept. of Biological Sciences**  
University of Montreal, \$1,500
  - President's Award for the Best Student Oral Presentation**  
Canadian Society of Plant Biologists (CSPB), Botany 2015 Conference, \$500
  - Best Student Poster Award**  
Compute Canada, High Performance Computing Symposium HPCS 2015, \$500
  - G.-H. Duff Travel Scholarship**  
Canadian Society of Plant Biologists (CSPB), \$340
  - Jacques-Rousseau Travel Scholarship**  
Plant Biology Research Institute, University of Montreal, \$775
  - ★ **Excellence Scholarship from the Faculty of Graduate and Postdoctoral Studies**  
University of Montreal, \$3,000
- 2014
- Pehr-Kalm Scholarship**  
Montreal Botanical Garden, \$2,000
  - ★ **Travel Scholarship for International Interns**  
Government of Quebec (FRQNT) – Centre SÈVE, \$3,815
  - Jacques-Rousseau Travel Scholarship**  
Plant Biology Research Institute, University of Montreal, \$1,769

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## Scholarships and Awards (continued)

★ Major scholarship

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| 2013 | <p>★ <b>Marie-Victorin Excellence Scholarship</b><br/>Plant Biology Research Institute, University of Montreal, \$3,000</p> <p><b>Best Oral Presentation Award</b><br/>Journées du Centre SÈVE, \$300</p> <p><b>Jacques-Rousseau Travel Scholarship</b><br/>Plant Biology Research Institute, University of Montreal, \$850</p> <p><b>Best Oral Presentation Award</b><br/>Symposium of Biological Sciences, University of Montreal, \$100</p>  |
| 2012 | <p><b>FBSB M.Sc. Scholarship from the Dept. of Biological Sciences</b><br/>University of Montreal, \$1,200</p> <p>★ <b>Scholarship for Accelerated M.Sc.-to-Ph.D. Transition</b><br/>Faculty of Graduate and Postdoctoral Studies, University of Montreal, \$14,000</p>   |
| 2011 | <p><b>Travel Scholarship for Student Exchange in Canada</b><br/>French Ministry of Research (CROUS), €1,600</p> <p><b>PIL Excellence Scholarship for Student Exchange in Canada</b><br/>Pierre &amp; Marie Curie University (Paris VI), €1,500</p> <p><b>AMIÉ Travel Scholarship for Student Exchange in Canada</b><br/>French Regional Authority (<i>Conseil régional</i>), €2,800</p> <p><b>Campus'Trotter Scholarship for Student Exchange in Canada</b><br/>French Local Authority (<i>Conseil général</i>), €700</p> |
| 2010 | <p><b>Best B.Sc. Student in the Dept. of Biology</b><br/>Pierre &amp; Marie Curie University (UPMC), after the June 2010 final exams</p>  |
| 2008 | <p>★ <b>Excellence Scholarship for Undergraduate Studies</b><br/>French Ministry of Research (CROUS), €5,400</p>  |

## Service

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|------------------------|--|
| Societies              | <p>American Society of Plant Biologists (ASPB), since 2016</p> <p>Canadian Society of Plant Biologists (CSPB), since 2014</p> <p>International Association of Sexual Plant Reproduction Research (IASPRR), since 2015</p> <p>Quebec Biological Association (ABQ), 2013–2018</p> <p>French Botanical Society (SBF), 2010–2011</p> |
| Students' associations | <p>Naturalist Students' Association <i>Timarcha</i>, 2010–2011<br/>Pierre &amp; Marie Curie University (UPMC), Paris, France</p> <p>Environmental Committee <i>Éco-école</i>, 2006–2008<br/>Lycée Saint-Sauveur (≈ high school), Redon, France</p>   |

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## Service (continued)

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Volunteering	<p><b>Volunteer French teacher for newcomers to Canada, 2015–2016</b> Community Center <i>The House of Friendship</i>, Montreal, Quebec</p> <ul style="list-style-type: none"><li>• 3-hour lessons every week with 10-20 students</li></ul> <p><b>Contributor to various online projects:</b></p> <ul style="list-style-type: none"><li>• Writer and translator for <i>Wikipedia</i> (biology-related articles), since 2008</li><li>• Volunteer cartographer for <i>OpenStreetMap</i>, since 2015</li><li>• Herbarium digitalization for the Paris National Museum of Natural History (Project "<i>Les Herbonautes</i>"), 2015</li></ul>
Communication	<p><b>Radio interview</b> for the science popularization program <i>Les années lumière</i> on Radio-Canada. Broadcasted on Apr. 24th 2016.</p> <p><b>Popularization article</b> written for <i>L'ARN messenger</i>, online biology students' journal at the University of Montreal. Published on Dec. 19th 2014.</p>

## Other skills

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Languages	<p><b>French</b>, mother tongue</p> <p><b>English</b>, fluent</p> <p><b>Spanish</b>, fluent</p> <p><b>Italian</b>, intermediate</p> <p><b>Japanese</b>, beginner</p>
Computing	<p><b>Programming:</b> mostly Python/BioPython and R. Bases in C and Perl.</p> <p><b>Web :</b> HTML/CSS, Jekyll.</p> <p><b>Operating systems:</b> Linux (<i>Ubuntu</i>, <i>Fedora</i>, <i>CentOS</i>); Mac OS X ; Windows</p> <p><b>Bioinformatics:</b> assemblers (<i>Trinity</i>, <i>CLC</i>, etc.); read aligners (<i>Bowtie</i>, <i>TopHat</i>, etc.); sequence search and alignment tools (<i>BLAST</i>, etc.); annotators (<i>BLAST2GO</i>, <i>PFAMscan</i>, <i>SignalP</i>, etc.)</p> <p><b>Office software:</b> <math>\text{\LaTeX}</math>, <i>LibreOffice/OpenOffice</i>, <i>Microsoft Office</i></p> <p><b>Image processing:</b> <i>GIMP</i>, <i>Inkscape</i>, <i>ImageJ</i>, <i>Adobe Photoshop</i>, <i>Cytoscape</i> ; <i>AxioVision</i> (Zeiss microscope steering program)</p>