BIOGRAPHICAL SKETCH

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NAME: Jean-François Trempe

eRA COMMONS USER NAME (credential, e.g., agency login): n.a.

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
McGill University, Montreal, Quebec, Canada	BSc	06/2000	Biochemistry
McGill University, Montreal, Quebec, Canada	MSc	02/2003	Biochemistry
University of Oxford, United Kingdom	DPhil	01/2007	Biochemistry
McGill University, Montreal, Quebec, Canada	Postdoc	08/2010	Biochemistry
Montreal Neurological Institute, Montreal, Quebec, Canada	Postdoc	07/2012	Neuroscience

A. Personal Statement

Jean-Francois Trempe obtained his doctorate degree from the University of Oxford in 2007. After postdoctoral training at McGill and the Montreal Neurological Institute, he obtained a Faculty position at McGill in 2013. His goal is to elucidate the function of proteins implicated in Parkinson's disease (PD) through 3D structure determination and proteomics studies, as well as design small molecules to modulate their activities. In collaboration with the Michael J. Fox Foundation and the SGC, his lab aims to design and characterize small-molecules activators for Parkin and PINK1. He holds a Tier 2 Canada Research Chair in Structural Pharmacology and has received the *New Investigator Award* from Parkinson Canada in 2014. He has published a total of 51 articles during his career (H-index 24, 2880 citations), mostly on the topics of ubiquitin and neurodegenerative diseases. His most important contribution to date is the structure determination of Parkin, published in *Science* in 2013, which revealed the mechanism of action of this important PD target.

B. Positions and Honors

Positions

2012-2013 Research Associate, Montreal Neurological Institute, McGill University
2013-2019 Assistant Professor, McGill University, Department of Pharmacology & Therapeutics
2019-now Associate Professor (tenured), McGill University, Department of Pharmacology & Therapeutics

Honors & Fellowships

2000-2002 NSERC Scholarship for Graduate Studies.
2002-2006 Wellcome Trust Studentship for Structural Biology (Oxford)
2007-2009 Richard H. Tomlinson postdoctoral fellowship (McGill University)
2007-2010 Canadian Institute of Health Research (CIHR) postdoctoral fellowship
2010-2012 Parkinson Canada, Basic Resarch Fellowship (postdoctoral)
2014-2016 Parkinson Canada, New Investigator Award
2014-2024 Canada Research Chair in Structural Pharmacology (Tier 2)

Committees, membership

2013-2018 Member of the FRQS *Groupe de Recherche Axé sur la Structure des Protéines* (GRASP)
2015-2018 Member of the FRQS *Groupe d'Étude des Protéines Membranaires* (GEPROM)
2014-now Member of the FRQS *Réseau Parkinson Québec*
2015-now Member of the Michael J. Fox Foundation Parkin Consortium group
2016-now Scientific Advisory Board, Parkinson Canada
2017-now Evaluation committee, CIHR Planning & Dissemination grants
2018-now Member of the FRQS *Centre de Recherche en Biologie Structurale* (CRSB)
2019-now Chair of the Training & Awards Committee, CRBS
2019-now Comité d'évaluation, FRQNT

Consulting and Industrial activities

-Mitokinin Inc, consultant and collaborator
-M4ND Pharma Inc, scientific collaborator
-Molomics Inc, collaborator

C. Contributions to Science

Publications in last 5 years

*Indicates equal contributions to work #Indicates corresponding authors Trempe trainees underlined

1. Khan N*, Pelletier D*, Veyron S, Croteau N, Ichikawa M, Black C, Khalifa A, Chaaban S, Kurinov I, Brouhard G, Kurinov I, Bui KH, **Trempe J-F**# (2019) Crystal structure of human PACRG in complex with MEIG1. ***BioRxiv***, doi.org/10.1101/783373.
2. Khalifa A, Ichikawa M, Dai D, Black C, Peri K, McAlear TS, Kubo S, Veyron S, Yang SK, Vargas J, **Trempe J-F**, Bechstedt S, Bui KH# (2019) The inner junction complex of the cilia is an interaction hub that involves tubulin post-translational modifications. ***BioRxiv***, doi.org/10.1101/774695
3. Semmler S, Gagné M, Garg P, Pickles SR, Baudouin C, Hamon-Keromen E, Destroismaisons L, Khalfallah Y, Chaineau M, Caron E, Bayne AN, **Trempe J-F**, Cashman NR, Star AT, Haqqani AS, Durcan TM, Meiering EM, Robertson J, Grandvaux N, Plotkin SS, McBride HM, Vande Velde C# (2019) The E3 ubiquitin ligase TRAF6 is a novel interacting protein of amyotrophic lateral sclerosis-linked misfolded SOD1. ***BioRxiv***, doi.org/10.1101/780460
4. Léveillé E, Estiar MA, Krohn L, Spiegelman D, Dionne-Laporte A, Tarnopolsky M, Boycott KM, Yoon G, Suchowersky O, Dupré N, **Trempe J-F**, Rouleau GA, Gan-Or Z# (2019) SPTAN1 mutations cause autosomal recessive hereditary spastic paraplegia. ***Journal of Human Genetics,*** 64, 1145-1151. doi: 10.1038/s10038-019-0669-2. PMID 31515523
5. Fava, VM; Xu, YZ; Lettre, G; Thuc, NV; Orlova, M; Thai, VH; Croteau, N; Eldeeb, MA; MacDougall, EJ; Cambri, G; Tao, S; Lahiri, R; Adams, L; Fon, EA; **Trempe, J-F**; Cobat, A; Alcaïs, A; Abel, L; Schurr E# (2019) Pleiotropic effects for Parkin and LRRK2 in leprosy type-1 reactions and Parkinson's Disease. ***Proceedings of the National Academy of Sciences U.S.A.***, 116:15616-15624. doi: 10.1073/pnas.1901805116. PMID 31308240
6. Bayne, AN; **Trempe, J-F**# (2019) Mechanisms of PINK1, ubiquitin and Parkin interactions in mitochondrial quality control and beyond. ***Cellular and Molecular Life Sciences***, doi: 10.1007/s00018-019-03203-4. PMID 31254044
7. Svoboda, M; Konvalinka, J; **Trempe, J-F**; Šašková, KG# (2019). The yeast proteases Ddi1 and Wss1 are both involved in the DNA replication stress response. ***DNA Repair (Amst)***, 80: 40-51. doi: 10.1016/j.dnarep.2019.06.008. PMID 31276951
8. Alcalay, RN; Mallett, V; Vanderperre, B; Tavassoly, O; Dauvilliers, Y; Leblond, CS; Ambalavanan, A; Laurent, SB; Spiegelman, D; Dionne-Laporte, A; Liong, C; Levy, OA; Fahn, S; Waters, C; Kuo, SH; Chung, WK; Ford, B; Marder, KS; Kang, UJ; Hassin-Baer, S; Greenbaum, L; **Trempe, J-F**; Wolf, P; Oliva, P; Zhang, XK; Clark, LN; Langlois, M; Dion, PA; Fon, EA; Dupré, N; Rouleau, GA; Gan-Or Z (2019) SMPD1 mutations, activity and -synuclein accumulation in Parkinson's disease. ***Movement Disorders***, 34: 526-535. doi: 10.1002/mds.27642, PMID 30788890

9. Yi, W; MacDougall ,EJ; Tang, MY; Krahn,, AI; Gan-Or Z; **Trempe, J-F**; Fon EA. The Landscape of Parkin Variants Reveals Pathogenic Mechanisms and Therapeutic Targets in Parkinson's Disease. ***Human Molecular Genetics***, pii: ddz080. doi: 10.1093/hmg/ddz080, PMID 30994895
10. Laughlin, TG; Bayne, A; **Trempe, J-F**; Savage DF; Davies KM#. (2019) Structure of NDH, the complex I-like molecule of oxygenic photosynthesis. ***Nature***, 566: 411-414. doi: 10.1038/s41586-019-0921-0. PMID 30742075
11. **Trempe, J-F#**; Gehring, K# (2018). Small-angle X-ray scattering for the study of proteins in the ubiquitin pathway. In: Mayor & Kleiger (eds) *The Ubiquitin Proteasome System*, ***Methods in Molecular Biology***. 1844: 197-208. doi: 10.1007/978-1-4939-8706-1_13. PMID 30242711
12. Rasool, S; **Trempe, J-F#** (2018). New insights into the structure of PINK1 and the mechanism of ubiquitin phosphorylation. ***Critical Reviews in Biochemistry and Molecular Biology***. 21: 1-20. doi: 10.1080/ 10409238.2018.1491525. PMID 30238821
13. Sauvé, V*; Sung, G*; Soya, N; Kozlov, G; Blaimschein, N; Miotto, LS; Trempe, J-F#; Lukacs, GL; Gehring, K# (2018). Mechanism of parkin activation by phosphorylation. ***Nature Structural and Molecular Biology***. 25: 623-630. doi: 10.1038/s41594-018-0088-7. PMID 29967542
14. Ménade, M*; Kozlov, G*; **Trempe, J-F***; Pande, H; Shenker, S; Wickremasinghe, S; Dicaire, M-J; Li, X; Brais, B; McPherson, PS; Gehring, K# (2018). Structures of Ubl and Hsp90-like domains of sacsin provide insight into pathological mutations. ***Journal of Biological Chemistry***. 293: 12832-42. doi: 10.1074/jbc.RA118.003939, PMID 29945973
15. Ruskey, JA; Zhou, S; Santiago, R; Franche, LA; Alam, A; Roncière, L; Spiegelman, D; Fon, EA; **Trempe, J-F**; Kalia, LV; Postuma, RB; Dupre, N; Rivard, GE; Assouline, S; Amato, D; Gan-Or, Z# (2018). The GBA p.Trp378Gly mutation is a probable French-Canadian founder mutation causing Gaucher disease and synucleinopathies. ***Clinical Genetics***, 94:339-345. doi: 10.1111/cge.13405, PMID 29920646
16. McLelland, G-L; Yi, W; Dorval, G; Chen, CX; Lauinger, ND; Valimehr, S; Rakovic, A; Rouiller, I; Durcan, TM; **Trempe, J-F**; Fon, EA# (2018). Mfn2 ubiquitination by PINK1/parkin gates the p97-dependent release of ER from mitochondria to drive mitophagy. ***eLife***, 7:e32866. doi: 10.7554/eLife.32866. PMID 29676259
17. Rasool, S; Soya, N*; Truong, L*; Croteau, N; Lukacs, G; **Trempe, J-F#** (2018). PINK1 autophosphorylation is required for ubiquitin recognition. ***EMBO Reports***, 19: e44981. PMID 29475881
18. Tang, MY*; Vranas, M*; Krahn, AI; Pundlik, S; **Trempe, J-F#**; Fon, EA# (2017) Structure-guided mutagenesis reveals a hierarchical mechanism of Parkin activation. ***Nature Communications***, 8:14697. doi: 10.1038/ncomms14697. PMID 28276439
19. **Trempe, J-F#**; Šašková, KG; Sivá, M; Ratcliffe, CD; Veverka, V; Hoegl, A; Ménade, M; Feng, X; Shenker, S; Svoboda, M; Kožíšek, M; Konvalinka, J; Gehring K (2016). Structural studies of the yeast DNA damage-inducible protein Ddi1 reveal domain architecture of this eukaryotic protein family. ***Scientific Reports***, 6:33671. doi: 10.1038/srep33671. PMID 27646017
20. Sivá, M; Svoboda, M; Veverka, V; **Trempe, J-F**; Hofmann, K; Kožíšek, M; Hexnerová, R; Sedlák, F; Belza, J; Šácha, P; Hubálek, M; Starková, J; Flaisigová, I; Konvalinka, J; Šašková, KG# (2016). Human DNA-Damage-Inducible 2 Protein is structurally and functionally distinct from its yeast ortholog. ***Scientific Reports***, 6:30443. doi: 10.1038/srep30443. PMID 27461074
21. Sauvé, V*; Lilov, A*; Seirafi, M*; Vranas, MM; Rasool, S; Kozlov, G; Sprules, T; Wang, J; **Trempe, J-F#**; Gehring, K#. (2015) A Ubl/ubiquitin switch in the activation of Parkin. ***EMBO Journal***, e201592237. doi: 10.15252/embj.201592237. PMID 26254305
22. Aguileta, MA; Korac, J; Durcan, TM; **Trempe, J-F**; Haber, M; Gehring, K; Elsasser, S; Waidmann, O; Fon, EA; Husnjak, K. (2015) The E3 ubiquitin ligase parkin is recruited to the 26 S proteasome via the proteasomal ubiquitin receptor Rpn13. ***Journal of Biological Chemistry***, 290: 7492-505. doi: 10.1074/jbc.M114.614925. PMID 25666615
23. Koyano, F; Okatsu, K; Kosako, H; Tamura, Y; Go, E; Kimura, M; Kimura, Y; Tsuchiya, H; Yoshihara, H; Hirokawa, T; Endo, T; Fon, EA; **Trempe, J-F**; Saeki, Y; Tanaka, K; Matsuda, N. (2014) Ubiquitin is phosphorylated by PINK1 to activate parkin. ***Nature***, 510: 162-6. doi: 10.1038/nature13392. PMID 24784582

Selected publications, 2001 to 2013

1. **Trempe, J-F***; Sauvé, V*; Grenier, K; Seirafi, M; Tang, MY; Ménade, M; Al-Abdul-Wahid, S; Krett, J; Wong, K; Kozlov, G; Nagar, B; Fon, EA[#]; Gehring, K[#] (2013) Structure of parkin reveals mechanisms for ubiquitin ligase activation. ***Science***, 340: 1451-1455. doi: 10.1126/science.1237908. PMID 23661642
2. **Trempe, J-F[#]**; Fon, EA[#] (2013) Structure and function of Parkin, PINK1 and DJ-1, the three musketeers of neuroprotection. ***Frontiers in Neurology***, 4: 38. doi: 10.3389/fneur.2013.00038. PMID 23626584
3. **Trempe, J-F[#]** (2011) Reading the ubiquitin postal code. ***Current Opinion in Structural Biology***, 21: 792-801. doi: 10.1016/j.sbi.2011.09.009. PMID 22036065
4. **Trempe, J-F[#]**; Shenker, S; Kozlov, G; Gehring, K (2011) Self-association studies of the bifunctional N-acetylglucosamine-1-phosphate uridyltransferase from *Escherichia coli*. ***Protein Science***, 20: 745-752. doi: 10.1002/pro.608. PMID 21370307
5. Riedinger, C*; Boehringer, J*; **Trempe, J-F***; Lowe, ED; Brown, NR; Gehring, K; Noble, MEM; Gordon, C; Endicott, JA[#] (2010) The structure of Rpn10 and its interactions with polyubiquitin chains and the proteasome subunit Rpn12. ***Journal of Biological Chemistry***, 285: 33992-34003. doi: 10.1074/jbc.M110.134510. PMID 20739285
6. **Trempe, J-F[#]**; Brown, NR; Noble, MEM; Endicott, JA (2010) A new crystal form of Lys48-linked diubiquitin. ***Acta Crystallographica Section F***, 66: 994-998. doi: 10.1107/S1744309110027600. PMID 20823512
7. **Trempe, J-F***; Chen, CXQ*; Grenier, K; Camacho, EM; Kozlov, G; McPherson, PS; Gehring, K[#]; Fon, EA[#] (2009) SH3 domains from a subset of BAR-proteins define a novel Ubl-binding domain and implicate parkin in synaptic ubiquitination. ***Molecular Cell,*** 36: 1034-1047. doi: 10.1016/j.molcel.2009.11.021. PMID 20064468
8. **Trempe, J-F**; Endicott, JA[#] (2007) Structural biology: Pass the protein. ***Nature***, 445 : 375-376. doi: 10.1038/nature05564. PMID 17220873
9. **Trempe, J-F**; Brown, NR; Lowe, ED; Gordon, C; Campbell, ID; Noble, MEM; Endicott, JA[#] (2005) Mechanism of Lys48-linked polyubiquitin chain recognition by the Mud1 UBA domain. ***EMBO Journal***, 24 : 3178-3189. doi: 10.1038/sj.emboj.7600797. PMID 16138082
10. **Trempe, J-F**; Denisov, A; Gehring, K[#] (2003) Recoupling of residual dipolar couplings in single-domain polymer-stabilized liquid crystals undergoing magic-angle spinning. ***Journal of Magnetic Resonance***, 164: 329-337. doi:10.1016/S1090-7807(03)00247-7. PMID 14511601
11. **Trempe, J-F**; Gehring, K[#] (2003) Observation and interpretation of residual dipolar couplings in biomolecules, in *NMR of Ordered Liquids* (eds. E. Elliott Burnell and Cornelius A. de Lange), Chapter 8, pp. 163-190, Kluwer Academic Publishers, The Netherlands.
12. **Trempe, J-F**; Morin, FG; Xia, X; Marchessault, RH; Gehring, K[#] (2002) Characterization of polyacrylamide-stabilized Pf1 phage liquid crystals for protein NMR spectroscopy. ***Journal of Biomolecular NMR***, 22: 83-87. PMID 11885983
13. **Trempe, J-F**; Wilds, CJ; Denisov, AY; Pon, RT; Damha, MJ; Gehring, K[#] (2001) NMR solution structure of an oligonucleotide hairpin with a 2'F-ANA/RNA stem: implications for RNase H specificity toward DNA/RNA hybrid duplexes. ***Journal of the American Chemical Society,*** 123: 4896-4903. doi : 10.1021/ja003859p. PMID 11457316

D. Additional Information: Research Support and/or Scholastic Performance

Current Support

CIHR Tier 2 Canada Research Chair (CRC)
Title: Canada Research Chair in Structural Pharmacology
Principal Investigator: Jean-François Trempe
Funding: April 2014 – April 2024; $1,000,000.

NSERC – Discovery grant
Title: Structural and functional studies of ubiquitin kinases
Principal Investigator: Jean-François Trempe
Funding: May 2015 - Apr 2020; $175,000 CDN

Canadian Fund for Innovation - Reserve Fund (McGill Faculty of Medicine internal competition)
Title: SPR-MS Facility
Principal Investigators: Jean-François Trempe and Gerhard Multhaup
Funding: Sep 2018 - Aug 2021; $75,000 CDN

CIHR – Project Scheme
Title: Structural and mechanistic studies of PINK1, a mitochondrial ubiquitin kinase implicated in Parkinson's disease.
Principal Investigator: Jean-François Trempe; Collaborators: Gergely Lukacs, Edward Fon
Funding: Apr 2017 - Mar 2022; $620,000 CDN

Michael J. Fox Foundation – Target Optimization Program
Title: Characterization of new Parkin activation mutants
Principal Investigator: Jean-François Trempe
Co-PIs: Edward Fon, Thomas Durcan, Miratul Muqit, Wolfdieter Springer
Funding period: Jan 2018 - Dec 2019, $312,500 USD

Michael J. Fox Foundation – Target Optimization Program
Title: New activators of Parkin
Principal Investigator: Giovanni Cincilla (Molomics Biotech, Barcelona), role: co-PI
Funding: January 2019 - December 2019; $122,000 USD ($25,000 to McGill)

Michael J. Fox Foundation – Target Optimization Program
Title: Structure-based design of small-molecule activators of Parkin
Principal Investigator: Jean-François Trempe
Collaborators: David Drewry, William Zuercher (SGC – University of North Carolina)
Funding: Nov 2018 - Feb 2020; $150,000 USD

Healthy Brains & Healthy Lives (CFREF McGill) Innovative Ideas program
Title: Measuring protein turnover in organoid and animal models of Parkinson's disease.
Principal Investigator: Jean-François Trempe
Collaborators: Thomas Durcan, Edward Fon
Funding: Apr 2018 - Mar 2020; $85,000 CDN

Canadian Fund for Innovation – John R. Evans Leaders Fund (CFI-JELF)
Title: Conformational dynamics of complex proteins in health and diseases
Principal Investigator: Gergely Lukacs (McGill), role: co-applicant
Funding: 2020-2025 (decision Nov 2019); $ 1,481,590 CDN

Completed support

- 2017-2018 Pilot Project *Parkinson Canada (*$45K CDN*)*
- 2017 *Michael J. Fox Foundation* Research Contract with Evotec ($17K USD)
- 2016-2017 *Michael J. Fox Foundation* Target Advancement 2016 RFA ($96K USD)
- 2016-2017 *Michael J. Fox Foundation* Target Optimization Award ($88K USD)
- 2014-2016 New Investigator Award of *Parkinson Canada (*$90K CDN*)*
- 2014-2019 Canadian Fund for Innovation - Leaders Opportunity Fund ($715,000 CDN)
- 2013-2015 GRASP (FRQS) Start-up package ($52K CDN)
- 2013-2015 Faculty of Medicine, McGill University, Start-up package ($190K CDN)
- 2013-2014 *MJFF* Rapid Response Innovation Award ($75K USD).