

**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 55 articles during his career (H-index 28, 3673 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  
 2020-now Director, Proteomics Platform, Research Institute of the McGill University Health Center

**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 Research 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 <i>Groupe de Recherche Axé sur la Structure des Protéines</i> (GRASP)
2015-2018	Member of the FRQS <i>Groupe d'Étude des Protéines Membranaires</i> (GEPROM)
2014-now	Member of the FRQS <i>Réseau Parkinson Québec</i>
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 <i>Centre de Recherche en Biologie Structurale</i> (CRSB)
2019-now	Chair of the Training & Awards, and Outreach Committees, CRBS
2019-now	Comité d'évaluation, FRQNT

## Current consulting and Industrial activities

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

## 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\*, McAlear TS, Croteau N, Veyron S, Bayne AN, Black C, Ichikawa M, Khalifa AAZ, Chaaban S, Kurinov I, Kurinov I, Brouhard G, Bechstedt S, Bui KH, Trempe J-F# (2021) Crystal structure of human PACRG in complex with MEIG1 reveals roles in axoneme formation and tubulin binding. *Structure*, in press. [doi.org/10.1101/783373](https://doi.org/10.1101/783373).
2. Robert RF, Bayne AN, Goiran T, Lévesque D, Boisvert F-M, Trempe J-F, Fon EA# (2021) Proteomic profiling of mitochondrial-derived vesicles in brain reveals enrichment of respiratory complex sub-assemblies and small TIM chaperones. *Journal of Proteome Research*, 20: 506-517
3. Eldeeb MA, Bayne AN, Trempe J-F, Fon EA# (2020) Fine-tuning TOM-mitochondrial import via ubiquitin. *Trends in Cell Biology*, 30: 425-427. [PMID 32345464](https://pubmed.ncbi.nlm.nih.gov/32345464/)
4. 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. *ELife*, e52760. [PMID 31951202](https://pubmed.ncbi.nlm.nih.gov/31951202/)
5. Semmler S, Gagné M, Garg P, Pickles SR, Baudouin C, Hamon-Keromen E, Destroismaisons L, Khalifallah 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. *J Biol Chem*, 295, 3808-3825. [PMID 32029478](https://pubmed.ncbi.nlm.nih.gov/32029478/)
6. Estiar MA, Léveillé E, Spiegelman D, Dupré N, Trempe J-F, Rouleau GA, Gan-Or Z# (2020) Clinical and genetic analysis of ATP13A2 in hereditary spastic paraplegia expands the phenotype. *Molecular Genetics Genomic Medicine*, pii: e1052. doi: 10.1002/mgg3.1052. [PMID 31944623](https://pubmed.ncbi.nlm.nih.gov/31944623/)
7. Krohn L, Öztürk TN, Vanderperre B, Ouled Amar Bencheikh B, Ruskey JA, Laurent SB, Spiegelman D, Postuma RB, Arnulf I, Hu MTM, Dauvilliers Y, Högl B, Stefani A, Monaca CC, Plazzi G, Antelmi E, Ferini-Strambi L, Heidebreder A, Rudakou U, Cochen De Cock V, Young P, Wolf P, Oliva P, Zhang XK, Greenbaum L, Liang C, Gagnon JF, Desautels A, Hassin-Baer S, Montplaisir JY, Dupré N, Rouleau GA, Fon EA, Trempe JF, Lamoureux G, Alcalay RN, Gan-Or Z# (2020) Genetic, Structural, and Functional Evidence Link TMEM175 to Synucleinopathies. *Annals of Neurology*, 87: 139-153. doi: 10.1002/ana.25629. [PMID 31658403](https://pubmed.ncbi.nlm.nih.gov/31658403/)

8. L veill  E, Estiar MA, Krohn L, Spiegelman D, Dionne-Laporte A, Tarnopolsky M, Boycott KM, Yoon G, Suchowersky O, Dupr  N, **Trempe J-F**, Rouleau GA, Gan-Or Z<sup>#</sup> (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](#)
9. 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, Alca s A, Abe L, Schurr E<sup>#</sup> (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](#)
10. Bayne AN, **Trempe J-F**<sup>#</sup> (2019) Mechanisms of PINK1, ubiquitin and Parkin interactions in mitochondrial quality control and beyond. *Cellular and Molecular Life Sciences*, 76: 4589-4611, doi: 10.1007/s00018-019-03203-4. [PMID 31254044](#)
11. Svoboda M, Konvalinka J, **Trempe J-F**,  a kov KG<sup>#</sup> (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](#)
12. Alcalay RN, Mallett V, Vanderperre, B, Tavassoly O, Dauvilliers Y, Leblond CS, Ambalavanan A, Laurent SB, Spiegelman D, Dionne-Laporte A, Liang 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, Dupr  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](#)
13. 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](#)
14. Laughlin TG, Bayne A, **Trempe J-F**, Savage DF, Davies KM<sup>#</sup>. (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](#)
15. **Trempe J-F**<sup>#</sup>, Gehring K<sup>#</sup> (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](#)
16. Rasool S, **Trempe J-F**<sup>#</sup> (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](#)
17. Sauv  V\*, Sung G\*, Soya N, Kozlov G, Blaimschein N, Miotto LS, Trempe J-F<sup>#</sup>, Lukacs GL, Gehring K<sup>#</sup> (2018). Mechanism of parkin activation by phosphorylation. *Nature Structural and Molecular Biology*. 25: 623-630. doi: 10.1038/s41594-018-0088-7. [PMID 29967542](#)
18. M nade M\*, Kozlov G\*, **Trempe J-F**\*, Pande H, Shenker S, Wickremasinghe S, Dicaire M-J, Li X, Brais B, McPherson PS, Gehring K<sup>#</sup> (2018). Structures of Ubl and Hsp90-like domains of saccin provide insight into pathological mutations. *Journal of Biological Chemistry*. 293: 12832-42. doi: 10.1074/jbc.RA118.003939, [PMID 29945973](#)
19. Ruskey JA, Zhou S, Santiago R, Franche LA, Alam A, Ronci re L, Spiegelman D, Fon EA, **Trempe J-F**, Kalia LV, Postuma RB, Dupre N, Rivard GE, Assouline S, Amato D, Gan-Or Z<sup>#</sup> (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](#)
20. McLelland G-L, Yi W, Dorval G, Chen CX, Lauinger ND, Valimehr S, Rakovic A, Rouiller I, Durcan TM, **Trempe J-F**, Fon EA<sup>#</sup> (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](#)
21. Rasool S, Soya N\*, Truong L\*, Croteau N, Lukacs G, **Trempe J-F**<sup>#</sup> (2018). PINK1 autophosphorylation is required for ubiquitin recognition. *EMBO Reports*, 19: e44981. [PMID 29475881](#)
22. Tang MY\*, Vranas M\*, Krahn AI, Pundlik S, **Trempe J-F**<sup>#</sup>, Fon EA<sup>#</sup> (2017) Structure-guided mutagenesis reveals a hierarchical mechanism of Parkin activation. *Nature Communications*, 8:14697. doi: 10.1038/ncomms14697. [PMID 28276439](#)
23. **Trempe J-F**<sup>#</sup>,  a kov KG, Siv M, Ratcliffe CD, Veverka V, Hoegl A, M nade M, Feng X, Shenker S, Svoboda M, Ko i sek 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](#)

24. 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<sup>#</sup> (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](#)

### Selected publications, 2001 to 2015

1. Sauvé V\*, Lilov A\*, Seirafi M\*, Vranas MM, Rasool S, Kozlov G, Sprules T, Wang J, **Trempe J-F**<sup>#</sup>, Gehring K<sup>#</sup>. (2015) A Ubl/ubiquitin switch in the activation of Parkin. **EMBO Journal**, e201592237. doi: 10.15252/embj.201592237. [PMID 26254305](#)
2. 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](#)
3. **Trempe J-F**<sup>\*</sup>, Sauvé V\*, Grenier K, Seirafi M, Tang MY, Ménade M, Al-Abdul-Wahid S, Krett J, Wong K, Kozlov G, Nagar B, Fon EA<sup>#</sup>, Gehring K<sup>#</sup> (2013) Structure of parkin reveals mechanisms for ubiquitin ligase activation. **Science**, 340: 1451-1455. doi: 10.1126/science.1237908. [PMID 23661642](#)
4. **Trempe J-F**<sup>#</sup>, Fon EA<sup>#</sup> (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](#)
5. **Trempe J-F**<sup>#</sup> (2011) Reading the ubiquitin postal code. **Current Opinion in Structural Biology**, 21: 792-801. doi: 10.1016/j.sbi.2011.09.009. [PMID 22036065](#)
6. **Trempe J-F**<sup>#</sup>, 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](#)
7. Riedinger C\*, Boehringer J\*, **Trempe J-F**<sup>\*</sup>, Lowe ED, Brown NR, Gehring K, Noble MEM, Gordon C, Endicott JA<sup>#</sup> (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](#)
8. **Trempe J-F**<sup>#</sup>, 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](#)
9. **Trempe J-F**<sup>\*</sup>, Chen CXQ\*, Grenier K, Camacho EM, Kozlov G, McPherson PS, Gehring K<sup>#</sup>, Fon EA<sup>#</sup> (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](#)
10. **Trempe J-F**, Endicott JA<sup>#</sup> (2007) Structural biology: Pass the protein. **Nature**, 445 : 375-376. doi: 10.1038/nature05564. [PMID 17220873](#)
11. **Trempe J-F**, Brown NR, Lowe ED, Gordon C, Campbell ID, Noble MEM, Endicott JA<sup>#</sup> (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](#)
12. **Trempe J-F**, Denisov A, Gehring K<sup>#</sup> (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](#)
13. **Trempe J-F**, Gehring K<sup>#</sup> (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.
14. **Trempe J-F**, Morin FG, Xia X, Marchessault RH, Gehring K<sup>#</sup> (2002) Characterization of polyacrylamide-stabilized Pf1 phage liquid crystals for protein NMR spectroscopy. **Journal of Biomolecular NMR**, 22: 83-87. [PMID 11885983](#)
15. **Trempe J-F**, Wilds CJ, Denisov AY, Pon RT, Damha MJ, Gehring K<sup>#</sup> (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 2021, \$210,000 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

#### 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

#### 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

#### Michael J. Fox Foundation – Target Optimization Program

Title: Structure of human PINK1-TOM complex by Single-particle Cryo-EM

Principal Investigator: Jean-François Trempe

Co-investigators: Edward Fon, Joaquin Ortega (McGill), Karen Davies (Lawrence Berkeley National Lab)

Funding period: Aug 2020 - Jul 2022, \$231,000 USD

#### Agora Open Science Trust – Research Grant, M4ND Program

Title: Structure-based development of parkin activators.

Principal Investigator: Jean-François Trempe

Funding period: Sep 2020 - Aug 2021, \$90,000 CDN

### Completed support

- 2019-2020 *Michael J. Fox Foundation* Contract with Molomics (\$25K USD)
- 2018-2020 *Michael J. Fox Foundation* Team Grant (\$312K USD, \$150K to McGill)
- 2018-2020 *Healthy Brains & Healthy Lives* (CFREF) Innovative Idea (\$85K CDN)
- 2018-2020 *Michael J. Fox Foundation* Target Optimization Parkin (\$150K USD)
- 2017-2018 Pilot Project *Parkinson Canada* (\$45K CDN)
- 2017 *Michael J. Fox Foundation* Contract with Evotec (\$17K USD)
- 2016-2017 *Michael J. Fox Foundation* Target Advancement PINK1 (\$96K USD)
- 2016-2017 *Michael J. Fox Foundation* Target Optimization Parkin (\$88K USD)
- 2014-2016 New Investigator Award of *Parkinson Canada* (\$90K CDN)
- 2014-2019 Canadian Fund for Innovation - Leaders Opportunity Fund (\$715,000 CDN)
- 2013-2014 *Michael J. Fox Foundation* Rapid Response Innovation Award (\$75K USD).