Mechanisms controlling microtubule diversity and functions

Lab ..... Regulation of microtubule dynamics and functions by the tubulin code

Team leader . Carsten JANKE (Carsten.Janke@curie.fr; +33 169863127)

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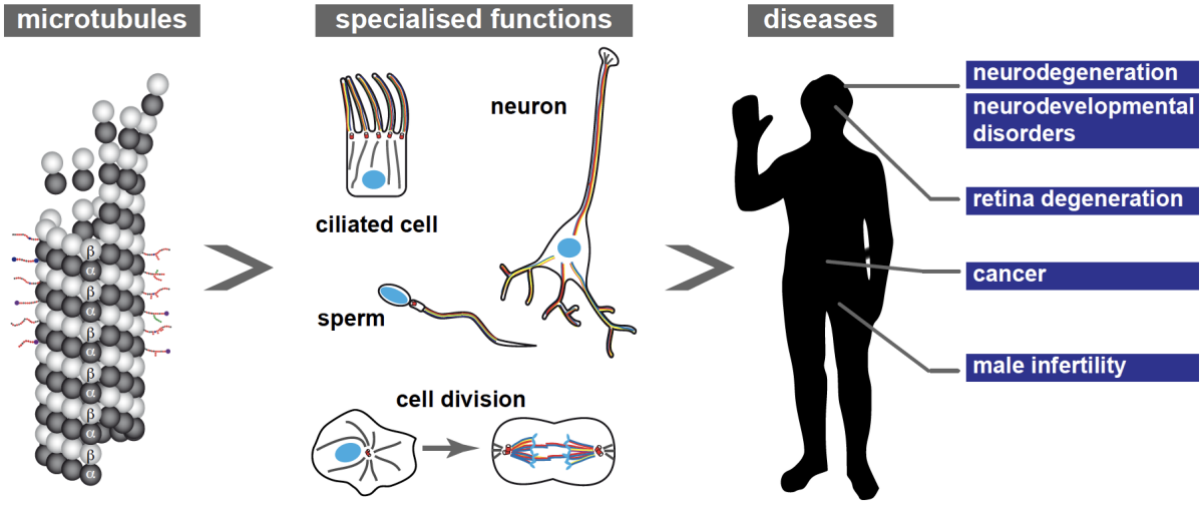
Salary ..... M2 monthly stipend 500-600 €

Follow-up ..... PhD studentship at the SDSV (www.ed-sdsv.u-psud.fr) or the FdV (https://cri-paris.org/fire) PhD programs

Who we are and what we do

We are a team of microtubule enthusiasts aiming at understanding how microtubules adapt to many different functions in living cells. We use an interdisciplinary approach to understand how microtubules are regulated at the molecular level to control their functions in cells, and how this contributes to organism homeostasis. This will tell us how dysfunctions of these mechanisms lead to disease, such as neurodegeneration, cancer, or male infertility.



Who we recruit

We recruit **creative and enthusiastic students motivated for interdisciplinary research**. Candidates will be given the opportunity to design their own master projects based on their interests. During their internship, candidates will receive close guidance from experienced researchers of our team, and will also interact with international collaborators.

Students acquire up-to-date technical expertise, learn to independently design experiments, and will be trained in communication skills during our weekly lab meetings. Successful master students will be able to apply for a PhD studentship to pursue their work in our team.

How to apply

Please send a motivation letter, CV, copies of transcripts (which lectures followed, grades and ranking, level of English), and if possible reference letters to Carsten.Janke@curie.fr.

Which projects are currently ongoing in our lab

Our lab offers projects in the domains of biology, developmental biology and biochemistry.

1. Molecular control of microtubule interactions with associated proteins (MAPs) – **cytoskeletal architecture**.
2. Polyglutamylation in neuronal development and function - **neurodegeneration**.
3. Glycylation in ciliary function and flagellar beating – **male fertility**.
4. The impact of tubulin mutations on microtubule mechanics, dynamics and functions – **neurodevelopmental disorders**.

Which techniques are used

Our team has expertise in a range of modern experimental techniques, such as

- Molecular cloning and protein expression in mammalian cells
- Lentivirus-mediated gene delivery
- In vitro reconstitution assays and TIRF microscopy
- CRISPR-Cas9 gene engineering
- Cell biology (including primary cell culture); live-cell imaging with spinning disk microscopy; long-term imaging with Incucyte
- Mouse biology, histology

Where to find more details

Janke C, Magiera MM (2020) The tubulin code and its role in controlling microtubule properties and functions. *Nat Rev Mol Cell Biol* **21:** 307-326

Magiera MM, Singh P, Gadadhar S, Janke C (2018) Tubulin Posttranslational Modifications and Emerging Links to Human Disease. *Cell* **173:** 1323-1327

Magiera MM, Bodakuntla S, Ziak J, Lacomme S, Marques Sousa P, Leboucher S, Hausrat TJ, Bosc C, Andrieux A, Kneussel M, Landry M, Calas A, Balastik M, Janke C (2018) Excessive tubulin polyglutamylation causes neurodegeneration and perturbs neuronal transport. *EMBO J* **37:** e100440

Gadadhar S, Dadi H, Bodakuntla S, Schnitzler A, Bieche I, Rusconi F, Janke C (2017) Tubulin glycylation controls primary cilia length. *J Cell Biol* **216:** 2701-2713

Barisic M, Silva e Sousa R, Tripathy SK, Magiera MM, Zaytsev AV, Pereira AL, Janke C, Grishchuk EL, Maiato H (2015) Microtubule detyrosination guides chromosomes during mitosis. *Science* **348:** 799-803

Rogowski K, van Dijk J, Magiera MM, Bosc C, Deloulme J-C, Bosson A, Peris L, Gold ND, Lacroix B, Bosch Grau M, Bec N, Larroque C, Desagher S, Holzer M, Andrieux A, Moutin M-J, Janke C (2010) A family of protein-deglutamylating enzymes associated with neurodegeneration. *Cell* **143:** 564-578