



**MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIPS 2018**  
**EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS**

### HOST INSTITUTION

Instituto de Tecnologia Química e Biológica António Xavier (ITQB-NOVA) | MOSTMICRO Research Unit

### RESEARCH GROUP AND URL

Biomolecular Self-Organization Laboratory  
<http://www.itqb.unl.pt/research/biological-chemistry/biomolecular-self-organization/>

### SUPERVISOR (NAME AND E-MAIL)

Alvaro H. Crevenna  
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### SHORT CV OF THE SUPERVISOR

AHC leads a research group at ITQB-NOVA, a biology and chemistry technology research institute in Oeiras, Portugal. The lab focuses on understanding the physico-chemical principles underlying spatio-temporal organization inside cells. We use biochemistry, reconstituted in vitro systems, quantitative live-cell imaging and single molecule fluorescence microscopy and spectroscopy. We complement our work with computer simulations, cryo-electron microscopy and tomography. AHC is one of the inventors of the 'lifeact' marker for live cell visualization of actin structures, used worldwide (>1400 citations since 2008). AHC started the lab in 2017 and has published > 20 papers in peer-review journals including Science, eLife, PNAS, Cell Reports, Nat Meth and the JCB. Additionally, AHC serves as R&D consultant of product development and commercialization of actin-related consumables for Hypermol GmbH (Bielefeld, Germany) since 2012 and is keen on transferring knowledge acquired in the lab into commercial applications.

### 5 SELECTED PUBLICATIONS

- Hoyer, M., Cabral-Correia, J. R., Lamb, D. C., Crevenna, A. H. Dimer arrangement and monomer flattening determine actin filament formation. (2018) biorxiv 294256; doi: <https://doi.org/10.1101/294256>.
- Nicoli, F., Barth, A., Bae, W., Neukirchinger, F., Crevenna, A.H., Lamb, D.C., Liedl, T. Homo-FRET Directional Photonic Wire on a DNA Origami Platform. ACS Nano (2017); <http://pubs.acs.org/doi/10.1021/acsnano.7b05631>.
- Crevenna, A. H.\*, Blank., B.\*, Maiser, A., Emin, D., Prescher, J., Beck, G., Kienzle, C., Bartnik, K., Habermann, B., Pakdel, M., Leonhardt, H., Lamb, D. C., von Blume, J. Secretory cargo sorting by Ca<sup>2+</sup>-dependent Cab45 oligomerization at the Trans Golgi Network. J. Cell Biol. (2016) May 9; 213(3):305-14.
- Jasnin, M., Crevenna, A. H. Quantitative Analysis of Filament Branch Orientation in Listeria Actin Comet Tails. Biophys. J. (2016) Feb 23; 110(4):817-26.



- Crevenna, A. H., Arciniega, M., Dupont, A., Kowalska, K., Mizuno, N., Lange, O., Wedlich-Soldner, R., Lamb, D. C. Side-binding proteins modulate actin filament dynamics. eLife (2015) Feb 23; 4; doi 10.7554/eLife.04599.

## PROJECT TITLE AND DESCRIPTION

### *Project title – to be defined*

I would like to elucidate the molecular mechanisms underlying the process of mechano-transduction in mammalian cells and that of bacterial coat formation. I believe that some molecular aspects of these two very different processes are shared, such as protein conformational changes, formation of multi-component macromolecular complexes and a spatio-temporal regulation. We have some hypotheses concerning the role of weak protein-protein interactions and liquid-liquid phase separation that need testing. We'll approach those unanswered questions through biochemical reconstitution, home-built microscope systems, live cell imaging and super-resolution, as well single molecule fluorescence.

## SCIENTIFIC AREA WHERE THE PROJECT FITS BEST

Life Sciences (LIF)