



**Postdoctoral Positions on Quantum Biology**

Applications are invited for postdoctoral positions at the Systems Biology and Bioengineering Group of Professor Savas Tay, at the Institute for Molecular Engineering, **University of Chicago** ([taylab.uchicago.edu](http://taylab.uchicago.edu/)).

This DOD funded project is a collaboration between Savas Tay and David Awschalom labs, and is at the nexus of Cell Signaling and Quantum Information Processing. Our project has two goals:

1. Use **nano-diamond quantum sensors** to perform precision measurements in living cells during immune signaling scenarios. These sensors allow ultra-sensitive measurements of temperature, pressure and orientation at room temperature, which will allow us to map the biophysical properties of living cells with unprecedented detail and precision.
2. Investigate the role of **quantum mechanical phenomena in cell signaling**. Recent literature on “quantum smell” (vibrational theory of olfaction) and similar topics has created quite controversy in Physics and Biology, and our goal here is to settle these questions by performing highly sensitive quantum measurements on single living cells in precisely controlled microfluidic environments.

The following papers describe our current research in cell signaling:

* Noise facilitates transcriptional control under dynamic inputs. **Cell** 160, 381 (2015)
* Noise induced NF-kB mode hopping enables temporal gene multiplexing. **Cell Systems**, 3: 532-539 (2016).
* Digital signaling decouples activation probability and population heterogeneity. **eLife** 4:e08931 (2015)
* Single-cell NF-kB dynamics reveal digital activation and analogue information processing. **Nature** 466, 267 (2010)
* Ultra-Multiplexed Analysis of Single Cell Dynamics Reveals Logic Rules in Differentiation, **Science Advances**, DOI: 10.1126/sciadv.aav7959 (2019)

Applications from a range of backgrounds including Biology, Physics, Chemistry, Engineering and Computer Science are invited. Required skills include cell culture, basic biochemistry, microscopy, image processing, and programming. Experience with microfluidics, cloning, signaling pathways and stochastic modeling are a plus. Using sophisticated computer controlled experimental setups will be necessary.

Our laboratory is located at the Knapp Center at the University of Chicago, and we are affiliated with the Institute for Molecular Engineering ([www.ime.uchicago.edu](http://www.ime.uchicago.edu)) and Institute for Genomics and Systems Biology (<http://www.igsb.anl.gov/>).

Highly motivated candidates with a strong track record of publications should send an application package with research interests, full CV with experimental and computational skills listed in detail, names and contact information of 3 references to Savas Tay ([**savas.tay@gmail.com**](mailto:savas.tay@gmail.com)).

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