



Postdoctoral Positions in

- 1) Ion channel structure, function, and chemical biology
- 2) Protein evolution/toxin resistance mechanisms

MINOR LAB UCSF - Cardiovascular Research Institute

Multiple postdoctoral positions are available immediately for highly motivated individuals with strong backgrounds in biophysics and an interest in **structural and chemical biology studies of ion channels** or **mechanisms of toxin recognition and resistance** in the lab of Prof. Dan Minor at the University of California, San Francisco (UCSF). The Minor Lab merges structural, biochemical, chemical biology, genetic, and electrophysiological methods to dissect mechanisms of complex protein machines involved in electrical signaling and to uncover mechanisms of toxin resistance in poison organisms.

1) Ion channel structure, function, and chemical biology

Projects focus on structural approaches to study ion channel function and development of chemical biology tools for a wide range of channel types. Candidates should have (or expect) an Ph.D. or M.D. and should have demonstrated achievements with X-ray crystallography, cryo-electronmicroscopy, or electrophysiology.

Ongoing projects focus on mechanisms of voltage-gated, thermosensitive, and mechanosensitive channels and efforts develop new agents to control and image ion channels involved in pain represented by:

Arrigoni, C, Lolicato, M., *et al.* , 'Quaternary structure independent folding of voltage-gated ion channel pore domain subunits' *Nature Structural and Molecular Biology* **2022 Jun 2**. doi: [10.1038/s41594-022-00775-x](https://doi.org/10.1038/s41594-022-00775-x). Online ahead of print.

Lolicato, M., Natale, A., Abderemane-Ali, F., Crottès, D. Capponi, S., Duman, R., Wagner, A., Rosenberg, J.M., Grabe, M., and Minor, D.L., Jr. '*K_{2P}2.1* channel C-type gating involves asymmetric selectivity filter order-disorder transitions' *Science Advances* **6** eabc9174 (2020)

Lolicato, M., Arrigoni, C., Mori, T., Sekioka, Y., Bryant, C., Clark, K.A., Minor, D.L., Jr. '*K_{2P}2.1*(TREK-1):activator complexes reveal a cryptic selectivity filter binding site' *Nature* **547** 364-368 (2017)

Arrigoni, C., Rohaim, A., Shaya, D., Findeisen, F., Stein, R.A. Nurva, S.R., Mishra, S., Mchaourab, H.S., and Minor, D.L., Jr., 'Unfolding of a temperature-sensitive domain controls voltage-gated channel activation' *Cell* **164** 922-936 (2016)

2) Mechanisms of toxin resistance in poison animals

This project focus on using protein engineering and molecular evolution methods to develop new classes of toxin binding proteins. Candidates should have (or expect) an Ph.D. or M.D. and should have demonstrated achievements in protein structure analysis, protein biophysics, or selection methods.

Ongoing projects in this area are represented by:

Yen, T.-J., Lolicato, M., Thomas-Tran, R., Du Bois, J., and Minor, D.L., Jr., '*Structure of the Saxiphilin:saxitoxin (STX) complex reveals a convergent molecular recognition strategy for paralytic toxins*' *Science Advances* **5**, eaax2650 (2019)

Abderemane-Ali, F., Rossen, N.D., Kobiela, M.E., Craig, R.A.II, Garrison, C.E., Chen, Z., O'Connell, L.A., Du Bois, J., Dumbacher, J.P., and Minor, D.L., Jr. '*Evidence that toxin resistance in poison birds and frogs is not rooted in sodium channel mutations and relies on 'toxin sponge' proteins*', *J. Gen. Physiol* **153**:e202112872 (2021)

More information is available at the lab website <http://www.cvri.ucsf.edu/~dminor/>

Fellows will benefit from both the outstanding lab environment and the highly collaborative UCSF community.

TO APPLY:

Interested individuals should send a current CV to Prof. Daniel Minor at daniel.minor@ucsf.edu