

Postdoctoral positions available:

The McFall-Ngai and Ruby labs have moved to the Carnegie Institution's new location on the Caltech campus in Pasadena, CA. This academic setting provides an intellectually dynamic and technologically cutting-edge environment for research on host-microbe interactions.

The squid-vibrio symbiosis, an experimental model that has been studied for over 30 years, offers unique opportunities to characterize the onset and maintenance of a single beneficial bacterial species within the light-emitting organ of a well-characterized marine host. Research topics include: (i) the biochemical and biophysical mechanisms by which specificity is determined in the first hours of partner interaction; (ii) a daily, rhythmic pattern of transcription that drives host immune responses and symbiont metabolism; (iii) the population dynamics of symbionts during persistence and, (iv) the role of small RNA signals carried from the bacterium into host cells by outer membrane vesicles. To address the questions associated with these research topics, we study both the bacterial symbiont, *Vibrio fischeri*, and its host, *Euprymna scolopes*, using transcriptomic, molecular genetic and genomic approaches, together with advanced imaging techniques.

Postdoctoral positions are open starting May 1, 2022.

Applicants must have strong self-motivation and a record of first-authored publications.

Contact: Ned Ruby eruby@carnegiescience.edu or Margaret McFall-Ngai mmcfallngai@carnegiescience.edu

Recent references

Nyholm, SV and MJ McFall-Ngai. 2021. A lasting symbiosis: how the Hawaiian bobtail squid finds and keeps its bioluminescent bacterial partner. **Nature Rev Microbiol** 19:666-679.

Visick, KL, EV Stabb and EG Ruby. 2021. A lasting symbiosis: how *Vibrio fischeri* finds a squid partner and persists within its natural host. **Nature Rev Microbiol** 19:654-665.

Moriano-Gutierrez, S, EG Ruby and MJ McFall-Ngai. 2021. MicroRNA-mediated regulation of initial host responses in a symbiotic organ. **mSystems** doi: 10.1128/mSystems.00081-21.

**Selected by the journal as 'Editor's Pick'.*

Essock-Burns, T, BD Bennett, D Arencibia, S Moriano-Gutierrez, M Medeiros, MJ McFall-Ngai and EG Ruby. 2021. Bacterial quorum sensing induces morphological change in a key host tissue during the *Euprymna scolopes*–*Vibrio fischeri* symbiosis. **mBio** doi: 10.1128/mBio.02402-21).

Koch, EJ, C Bongrand, BD Bennett, S Lawhorn, S Moriano-Gutierrez, M Pende, K Vadiwala, H-U Dodt, F Raible, W Goldman, EG Ruby and MJ McFall-Ngai. 2020. The cytokine MIF controls daily rhythms of symbiont nutrition in an animal-bacterial association. **Proc Natl Acad Sci USA** 117: doi: 10.1073/pnas.2016864117 .

Moriano-Gutierrez, S, C Bongrand, T Essock-Burns, L Wu, MJ McFall-Ngai and EG Ruby. 2020. The non-coding small RNA SsrA is released by *Vibrio fischeri* and modulates critical host responses. **PLoS Biol** 18: doi: 10.1371/journal.pbio.3000934 .

**Selected by the journal as "one of the most exciting papers of 2020".*

Bongrand, C, S Moriano-Gutierrez, P Arevalo, MJ McFall-Ngai, KL Visick, M Polz and EG Ruby. 2020. Using colonization assays and comparative genomics to discover symbiosis behaviors and factors in *Vibrio fischeri*. **mBio** 11: doi: 10.1128/mBio.03407-19.

Belcaid, M, et al. 2019. Symbiotic organs shaped by distinct modes of genome evolution in cephalopods. **Proc Natl Acad Sci USA** 116:3030-3035.