

# Curriculum Vitae

Seán O'Leary

## Personal Information:

### Address:

Department of Biochemistry,  
University of California, Riverside,  
3488B Boyce Hall,  
Riverside, CA 92521.

Phone: +1 (951) 827-4222

E-mail: [sean.oleary@ucr.edu](mailto:sean.oleary@ucr.edu)

## Education:

- 2010      **Ph.D.**, Chemistry and Chemical Biology, Cornell University  
Dissertation: "Exploring Novel Enzymology in Bacterial Metabolism: Cysteine Synthase, Urate Oxidase, and Bacimethrin Biosynthesis."  
Advisor: Tadhg P. Begley
- 2008      **M.S.**, Chemistry and Chemical Biology, Cornell University
- 2005      **B.Sc.(Hons)**, Chemistry, University College Dublin, Ireland

## Research Experience:

- 2016 –      **Assistant Professor of Biochemistry**, University of California, Riverside
- 2014 – 2016 **Basic Life Sciences Research Associate** and  
2010 – 2014 **Postdoctoral Scholar**, Stanford University School of Medicine  
Project: Single-molecule, biophysical and biochemical studies on eukaryotic translation initiation  
Advisor: Joseph D. Puglisi
- 2009 – 2010 **Research Assistant**, Texas A&M University  
Projects: Biochemical studies on PKS11, a type-III polyketide synthase from *M. tuberculosis*.  
Reconstitution and characterization of bacimethrin biosynthesis.  
Advisor: Tadhg P. Begley
- 2005 – 2009 **Graduate Research Assistant**, Cornell University  
Projects: Pre-steady-state kinetic studies on CysM, a cysteine synthase from *M. tuberculosis*.  
Biochemical characterization of HpxO, a novel flavin-dependent urate oxidase from *Klebsiella pneumoniae*.  
Investigation of the trapping of a glycosyl cation at the active site of crystals of uridine phosphorylase from *Escherichia coli* and *Bos taurus*.  
Studies on the biosynthesis of bacimethrin.  
Studies on the mechanism of formation of the DNA dimeric thymine lesion known as the "spore photoproduct".  
Advisor: Tadhg P. Begley

## Honors and Awards:

- 2014 –      NIH Pathway to Independence Career Development Award (K99/R00) (GM111858)  
2011      Dean's Postdoctoral Fellowship, Stanford University School of Medicine

2006	Hugh Ryan Memorial Medal, University College Dublin
2005	Eva Philbin Bowman Medal, University College Dublin
2004	University Scholarship, University College Dublin
2003	University Scholarship, University College Dublin
2002	University Scholarship, University College Dublin ( <i>Two scholarships</i> )
2001	Entrance Scholarship, University College Dublin

## Publications:

19. Petrov, A., Groseley, R., Chen, J., **O'Leary, S. E.**, Puglisi, J. D. (2016) Multiple parallel pathways of translation initiation on the CrPV IRES. *Mol. Cell* 62(1), 92–103.
18. Choi, J., Jeong, K.-W., Demirci, H., Chen, J., Petrov, A., Prabhakar, A., **O'Leary, S. E.**, Dominissini, D., Rechavi, G., Soltis, M., Ehrenberg, M., and Puglisi, J. D. (2016)  $N^6$ -methyladenosine in mRNA disrupts tRNA selection and translation elongation dynamics. *Nat. Struct. Mol. Biol.* 23(2), 110–115.
17. Chen, J., Coakley, A., O'Connor, M., Petrov, A., **O'Leary, S. E.**, Atkins, J. F., and Puglisi, J. D. Coupling of mRNA structure rearrangement to ribosome movement during bypassing of non-coding regions. *Cell* 163(5), 1267–1280.
16. Fuchs, G., Petrov, A. N., Marceau, C. D., Popov, L. M., Chen, J., **O'Leary, S. E.**, Wang, R., Carette, J. E., Sarnow, P., and Puglisi, J. D. (2015) Kinetic pathway of 40S ribosomal subunit recruitment to hepatitis C virus internal ribosome entry site. *Proc. Natl. Acad. Sci. USA* 112(2), 319–325.
15. Chen, J., Petrov, A., Johansson, M., Tsai, A., **O'Leary, S. E.**, and Puglisi, J. D. (2014) Dynamic pathways of -1 translational frameshifting. *Nature* 512(7514), 328–332.
14. Cooper, L. E.\*, **O'Leary, S. E.\***, and Begley, T. P. (2014). Biosynthesis of a thiamin antivitamin. *Biochemistry* 53(14), 2215–2217. \*Joint first-authorship.
13. Chen, J., Petrov, A., Dalal, R., Tsai, A., **O'Leary, S. E.**, Chapin, K., Cheng, J., Ewan, M., Hsuing, P.-L., Lundquist, P., Turner, S., Hsu, D. R., and Puglisi, J. D. (2013). High throughput platform for real-time monitoring of biological processes by multicolor single-molecule fluorescence. *Proc. Natl. Acad. Sci. USA* 111(2), 664–669.
12. **O'Leary, S. E.**, Petrov, A., Chen, J., and Puglisi, J. D. (2013) Dynamic recognition of the mRNA cap by *Saccharomyces cerevisiae* eIF4E. *Structure* 21(12), 2197–2207.
11. Vivona, S., Cipriano, D., **O'Leary, S.**, Li, Y. H., Fenn, T., and Brunger, A. T. (2013) Disassembly of all SNARE complexes by *N*-ethylmaleimide-sensitive factor (NSF) is initiated by a conserved 1:1 interaction between  $\alpha$ -soluble NSF attachment protein (SNAP) and SNARE complex. *J. Biol. Chem.* 288(34), 24984–24981.
10. Gokulan, K., **O'Leary, S. E.**, Russell, W. K., Russell, D. H., Lalgondar, M., Begley, T. P., Joergers, T. R., and Sacchettini, J. C. (2013) Crystal structure of *Mycobacterium tuberculosis* PKS11 reveals intermediates in the synthesis of methyl-branched alkylpyrones. *J. Biol. Chem.* 288(23), 16484–16494.
9. Chen, J., Petrov, A., Tsai, A., **O'Leary, S. E.**, and Puglisi, J. D. (2013) Coordinated conformational and compositional dynamics drive ribosome translocation. *Nat. Struct. Mol. Biol.* 20(6), 718–727.
8. Hicks, K. A., **O'Leary, S. E.**, Begley, T. P., and Ealick, S. E. (2013) Structural and mechanistic studies of HpxO, a novel flavin adenine dinucleotide-dependent urate oxidase from *Klebsiella pneumoniae*. *Biochemistry* 52(3), 477–487.
7. Chen, J., Tsai, A., **O'Leary, S. E.**, Petrov, A., and Puglisi, J. D. (2012) Unraveling the dynamics of ribosome translocation. *Curr. Opin. Struct. Biol.* 22(6), 804–814.
6. Petrov, A., Chen, J., **O'Leary, S.**, Tsai, A., and Puglisi, J. D. (2012) Single-molecule analysis of translational dynamics. *Cold Spring Harb. Perspect. Biol.* (Hershey, J. W. B., Sonenberg, N., Matthews, M. B., Eds.), doi: 10.1101/cshperspect.a011551.

5. Petrov, A., Kornberg, G., **O'Leary, S.**, Tsai, A., Uemura, S., and Puglisi, J. D. (2011) Dynamics of the translational machinery. *Curr. Opin. Struct. Biol.* 21(1) 137–145.
4. Paul, D., **O'Leary, S. E.**, Toms, A., Rajashankar, K., Bu, W., Settembre, E. C., Sanders, J. M., Begley, T. P., and Ealick, S. E. (2010), Glycol formation in crystals of uridine phosphorylase. *Biochemistry* 49, 3499–3509.
3. Hazra, A., Chatterjee, A., Chatterjee, D., Hilmey, D. G., Sanders, J. M., Hanes, J. W., Krishnamoorthy, K., McCulloch, K. M., Waitner, M. J., **O'Leary, S.**, and Begley, T. P. (2009), Coenzyme and prosthetic group biosynthesis, in *Encyclopedia of Microbiology* (Schaechter, M., Ed.) 3<sup>rd</sup> ed., pp 79–88, Academic Press, San Diego.
2. **O'Leary, S. E.**, Hicks, K. A., Ealick, S. E., and Begley, T. P. (2009) Biochemical characterization of the HpxO enzyme from *Klebsiella pneumoniae*, a novel FAD-dependent urate oxidase. *Biochemistry* 48(14), 3033–3035.
1. **O'Leary, S. E.**, Jurgenson, C. T., Ealick, S. E., and Begley, T. P. (2008) O-Phospho-L-serine and the thiocarboxylated sulfur carrier protein CysO-COSH are substrates for CysM, a cysteine synthase from *Mycobacterium tuberculosis*. *Biochemistry* 47(44), 11606–11615.

**Invited talks:**

2. Uppsala University, Uppsala, Sweden, 8/10/2016.
1. Pacific Biosciences, Menlo Park, CA, 3/17/2016.