Best papers highlighting important discoveries

[1] Cryo-EM structure of the inhibited (10S) form of myosin II.
Shixin Yang*, **Prince Tiwari***, Kyoung Hwan Lee, Osamu Sato, Mitsuo Ikebe, Raúl Padrón and Roger Craig.

Nature (Dec 2020) Volume 588, pages 521–525.* equal contribution. **(IF- 69.5)**

We obtained the first high-resolution structure (4.3 Å) of myosin in the inhibited state, revealing how head-head and head-tail interactions switch off the molecule by cryo-electron microscopy (Cryo-EM). This breakthrough research was published in Nature [1]. This was the most awaited structure in the field of myosin and cardiomyopathy. This structure became the first structure, and later, the two drugs for cardiomyopathy, mavacamten and aficamten, were discovered by other groups, later FDA-approved, which was in a way inspired by this molecular mechanism we proposed in this Nature paper.

2. Dilated cardiomyopathy mutation E525K in human beta-cardiac myosin stabilizes the interacting-heads motif and super- relaxed state of myosin
David V Rasicci, **Prince Tiwari**, Skylar ML Bodt, Rohini Desetty, Fredrik R Sadler, Sivaraj Sivaramakrishnan, Roger Craig, Christopher M Yengo.
eLife 2022;11: e77415. **(IF 8.14)**

This article highlights how a single-point dilated cardiomyopathy (DCM) mutation affects the myosin conformation and, as a result, the contraction-relaxation cycle of the human heart.

3. *Biochemical and Biophysical Roles of Cell Surface Molecules* (2018) pp 107-138, Advances in Experimental Medicine and Biology book series (**IF 3.7)**
Prince Tiwari, Arpita Mrigwani, Harpreet Kaur, Pallavi Kaila, Rajendra Kumar, Purnananda Guptasarma.

This summarises cell adhesion molecules (CAMs) and narrows the focus down progressively to the cadherins (calcium binding-dependent CAMs), classifications of subfamilies of the cadherins, and type I (E- and N-) cadherins. How disease affects these interactions at the cell surfaces and aspects of cadherin structure, stability and function.

4. Understanding anomalous mobility of proteins on SDS-PAGE with special reference to the highly acidic extracellular domains of human E- and N-cadherins.
Prince Tiwari, Pallavi Kaila, and Purnananda Guptasarma.
Electrophoresis (2019), 40,1273–1281. **(IF 3.6)**

This discovery was an exception to a well-established technique SDS-PAGE (very widely used by researchers in biology). This proves in what circumstances SDS-PAGE can show higher/lower mobility and thus tells incorrect protein mass. This was a useful finding for basic research.

5. N-terminal domain replacement changes an archaeal monoacylglycerol lipase into a triacylglycerol lipase.
Surabhi Soni, Sneha S. Sathe, Rutuja R. Sheth, **Prince Tiwari**, Rajesh-Kumar N. Vadgama, Annamma Anil Odaneth, Arvind M. Lali & Sanjeev K. Chandrayan
Biotechnology for Biofuels (2019) 12:110 **(IF 7.8)**

The important outcome was to engineer an archaeal esterase into a true thermostable lipase for industrial applications.

6. Multiple thermostable enzyme hydrolases on magnetic nanoparticles: An immobilized enzyme-mediated approach to saccharification through simultaneous xylanase, cellulase and amylolytic glucanotransferase action.
Arpana Kumari, Pallavi Kaila, **Prince Tiwari**, Vishal Singh, Sunaina Kaul, Nitin Singhal, and Purnananda Guptasarma. Int J Biol Macromol 2018 :1650-1658. **(IF 8.0)**

An elegant en immobilized enzyme combination that can be used in the saccharification of plant biomass.

7. PDB entry: **6XE9 (Smooth muscle myosin).**
Tiwari P., Padron R. Craig R.