

**Bertrand Coste, Ph.D.**  
Research Scientist  
CNRS Marseilles



## 2012 Finalist: Bertrand Coste, Ph.D.

Bertrand Coste is a CNRS Research Scientist at The Research Center of Neurobiology-Neurophysiology of Marseilles, France. He received his Ph.D. in Neurosciences from the University of the Mediterranean under the mentorship of Patrick Delmas. In his doctoral work, he worked on pain sensitivity and investigated the modulation of nociceptive neuron excitability during inflammation. After receiving his Ph.D., he moved to the Ardem Patapoutian Laboratory at The Scripps Research Institute in La Jolla, USA, where he was a postdoctoral fellow from 2007 to 2012. His work focused on the identification of molecular components involved in the transduction of mechanical forces into biological signals, and led to the identification of a new family of ion channels.

### **The Cellular Feeling of Pressure**

Mechanotransduction is the conversion of mechanical forces into biological signals. It allows our body to detect various forms of mechanical stimuli critical for touch, pain or hearing, but is not restricted to sensory systems and is involved in many other fundamental biological processes including blood pressure regulation, kidney fluid flow sensing, and bone homeostasis. The existence of ion channels directly activated by mechanical stimulation has been known for more than 30 years, but the identity of these molecules in mammals has remained elusive. By combining patch-clamp electrophysiology and genetic screening in mammalian cell-lines, Dr. Coste has identified piezo 1 and 2, the only members of a new family of mechanically activated ion channels that are expressed in many mechano-sensitive tissues including sensory neurons. In the fruit fly, piezo channels are involved in mechanical pain sensing. Future studies focusing on piezo channels and their roles will provide insights into mammalian mechanotransduction at molecular, cellular, tissue and organ levels.