



Contribution ID : 151

Type : Poster

Structural basis of the Trichoplax adhaerens Scribble and Dlg interactions with the PDZ-binding motif of Vangl

Thursday, 25 November 2021 17:42 (1)

Maintenance of multicellular tissue architecture is conserved process which is regulated by a highly conserved set of proteins. The interacting partners of these regulators are also conserved across the animal kingdom. Scribble and Dlg are two such key polarity regulators that involve in the establishment and maintenance of multicellular apical-basal cell polarity in epithelial cells. These are scaffolding proteins bearing multiple PDZ domains that mediate most of their interactions. Complex multicellular organisms evolved from the simple primitive forms; therefore, we examined Scribble and Dlg mediated cell polarity in the simplest metazoan living on earth, Placozoa, Trichoplax adhaerens. Despite its extreme simplicity, Trichoplax contains all polarity regulators that are fundamental to instruct the body plans in higher animals; thus, making it an ideal candidate to use as a polarity studying model. We now show biochemically that a key interaction for the establishment of cell polarity between Scribble and Dlg PDZ domains and Vangl in mammals is fully recapitulated in Trichoplax. We found that Scribble PDZ1, PDZ2 and PDZ3 interact with Vangl with affinities comparable to the human interaction, with a similar hierarchy in affinities. We also found that all three PDZ domains of Dlg interact with Vangl with no hierarchy of their affinities. We then show using crystal structures of Scribble PDZ1, PDZ2 and Dlg PDZ1, PDZ2 bound to the C-terminal PDZ binding motif of Vangl that in addition to the binding affinities, the detailed interactions between Scribble/Vangl and Dlg/Vangl are also conserved at the atomic level between Trichoplax and human.

Level of Expertise

Student

Presenter Gender

Woman

Pronouns

Which facility did you use for your research

Australian Synchrotron

Students Only - Are you interested in AINSE student funding

Yes

Do you wish to take part in the Student Poster Slam

Yes

Condition of submission

Yes

Primary author(s) : Mrs MADDUMAGE, Janesha (1Department of Biochemistry and Genetics, La Trobe University); Prof. KVANSAKUL, Marc (Department of Biochemistry and Genetics, La Trobe University; Research Centre for Molecular Cancer Prevention, La Trobe University); Prof. PATRICK , Humbert (1Department of Biochemistry and Genetics, La Trobe University, Melbourne, Victoria 3086, Australia; Research Centre for Molecular Cancer Prevention, La Trobe University, Melbourne, Victoria 3086, Australia ;Department of Biochemistry & Molecular Biology, University of Melbourne, Melbourne, Victoria 3010, Australia; Department of Clinical Pathology, University of Melbourne, Melbourne, Victoria 3010, Australia)

Presenter(s) : Mrs MADDUMAGE, Janesha (1Department of Biochemistry and Genetics, La Trobe University)

Session Classification : Poster Session

Track Classification : Biomedicine, Life science & Food Science