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

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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

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