

## Supplement 5

### Sodium Action Potentials in Placozoa: Insights into Behavioral Integration and Evolution of Nerveless Animals

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**Supplementary Data:** Domain organization of Na<sub>v</sub> channels in Placozoa: *Trichoplax adhaerens* (H1 haplotype), *Trichoplax* sp. (H2 haplotype), *Hoilungia* sp. (H4 haplotypes), *Hoilungia hongkongensis* (H13 haplotype).

**Yellow** – polar, acidic amino acids

**Light blue** – polar, basic amino acids

**Grey** – non-polar, hydrophobic amino acids

**Green** – polar, uncharged amino acids

**Purple** - cysteine

Gene ID	DI	DII	DIII	In.Gate	DIV	Pore
<i>Homo Nav</i> 1.1	QDFW	GEWI	FKGW	IFMT <del>EE</del> Q	SAGW	DEKA
<i>Homo Nav</i> 1.3	QDYW	GEWI	FKGW	IFMT <del>EE</del> Q	SAGW	
<i>Homo Nav</i> 1.5	QDCW	GEWI	FKGW	IFMT <del>EE</del> Q	SAGW	
<i>Homo Nav</i> 1.8	QDSW	GEWI	FKGW	IFMT <del>EE</del> Q	SAGW	
<i>Monosiga</i>	LDFW	GEWI	FEGW	LFLTEGQ	GAGW	DEEA
<i>Salpingoeca</i>	----	GEWI	FEGW	VLLTKAQ	AAGW	
<i>Mnemiopsis α</i>	MDIW	GEWI	FEGW	VLLTPGQ	SAGW	
<i>Mnemiopsis β</i>	LDFW	GEWI	----	VLLTPGQ	SAGW	
<i>Pleurobrachia</i>	LDFW	GEWI	FEGW	VLLTPGQ	SAGW	
<i>Sycon</i>	----	GEWI	FEGW	KFLTPSQ	AAGW	
<i>Sycon</i>	----	GEWV	FEGW	LLLTNEQ	AAGW	
<i>Sycon</i>	----	EGWV	LEGW	-LLTVDQ	GEDW	
<i>Cyanea</i>	LDYW	GKWI	LEGW	IFLTPGQ	AAGW	
<i>Clytia α</i>	----	GKWI	LEGW	FFLTPGQ	AAGW	
<i>Clytia β</i>	LDYW	GEWI	FEGW	VFLTTEQ	SAGW	DEEA
<i>Rhopilema α</i>	MDYW	GEWI	FEGW	IFLTSNQ	SAGW	DEEA
<i>Rhopilema β</i>	LDYW	GKWI	LEGW	ILLTAGQ	AAGW	DKEA
<i>Aurelia 21α</i>	LDYW	GKWI	LEGW	IFLTSQ	AAGW	DKEA
<i>Aurelia 21β</i>	MDYW	GEWI	FEGW	IFLTSQ	SAGW	DEEA
<i>Aurelia V2 α</i>	MDYW	GEWI	FEGW	IFLTSNQ	SAGW	DEEA
<i>Aurelia V2 β</i>	LDYW	GKWI	LEGW	IFLTSQ	AAGW	DKEA
<i>Morbakka</i>	LDFW	GKWI	LEGW	IFLTGGQ	AAGW	
<i>Chrysaora</i>	LDYW	GKWI	LEGW	IYLTTPGQ	AAGW	
<b>Placozoa</b>						
H1_Nav_1	MDFW	GEWV	FEGW	ILLTESQ	AAGW	DEEA
H2_Nav_1	MDFW	GEWV	FEGW	ILLTESQ	AAGW	
H4_Nav_1	MDFW	GEWI	FEGW	ILLTDSQ	SAGW	
H13_Nav_1	MDFW	GEWI	FEGW	ILLTDSQ	SAGW	
H1_Nav_2	LDNW	GEWI	FEGW	LFMTESQ	SAGW	
H2_Nav_2	LDNW	GEWI	FEGW	LFMTESQ	SAGW	
H4_Nav_2	LDNW	GEWI	FEGW	IFLTESQ	----	
H13_Nav_2	LDNW	GEWI	FEGW	IFLTESQ	----	
H1_Nav_3	QDAW	GEWI	FDGW	IYLTDSQ	AAGW	DEDA
H2_Nav_3	QDAW	GEWI	FDGW	IYLTDSQ	AAGW	
H4_Nav_3	QDAW	GEWK	FDGW	AFLSESQ	----	
H13_Nav_3	QDAW	GEWK	FDGW	AFLSESQ	----	
H1_Nav_4	QDQW	GEWS	LDGW	GALALNQ	AAGW	
H2_Nav_4	QDQW	GEWS	LDGW	-----	AAGW	
H4_Nav_4	QDQW	GEWS	LDGW	ALFTDTQ	----	
H13_Nav_4	EDQW	GEWS	QDGW	-----	----	
H1_Nav_5	QDQW	GEWS	----	-----	----	
H2_Nav_5	QDQW	GEWS	----	-----	----	
H4_Nav_6	QDQW	GEWS	MDGW	TLFTDSQ	GSGW	DEDS
H13_Nav_6	QDQW	GEWS	MDGW	TLFTDSQ	GSGW	DEDS
H13_Nav_7	LDNW	GEWS	LDGW	SLFTESQ	ATGW	DEDT
H4_Nav_7	LDNW	GEWS	LDGW	SLFTESQ	ATGW	DEDT
H4_Nav_7	LDNW	GEWS	LDGW	SLFTESQ	ASGW	DEDS
H13_Nav_7	LDNW	GEWS	LDGW	SLFTESQ	ATGW	DEDT