

Molecule of the month, PDE4DIP

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The gene product, phosphodiesterase 4D (PDE4D) is anchored at the centrosome-Golgi cell region by phosphodiesterase 4D interacting protein (PDE4DIP). PDE4D is a member of a family of phosphohydrolases. These enzymes are involved in signal transduction and hydrolyze 3' cyclic phosphate bonds in 3', 5'-cGMP and 3',5'-cAMP to energize several reactions in the cell. The latter are termed second messengers and their rates of degradation are regulated. Eleven subtypes of PDEs comprise reactions related to memory and learning as well as other processes including immune cell activation, hormonesecretion, smooth vascular muscle action, platelet aggregation, and cardiac contractility [1].

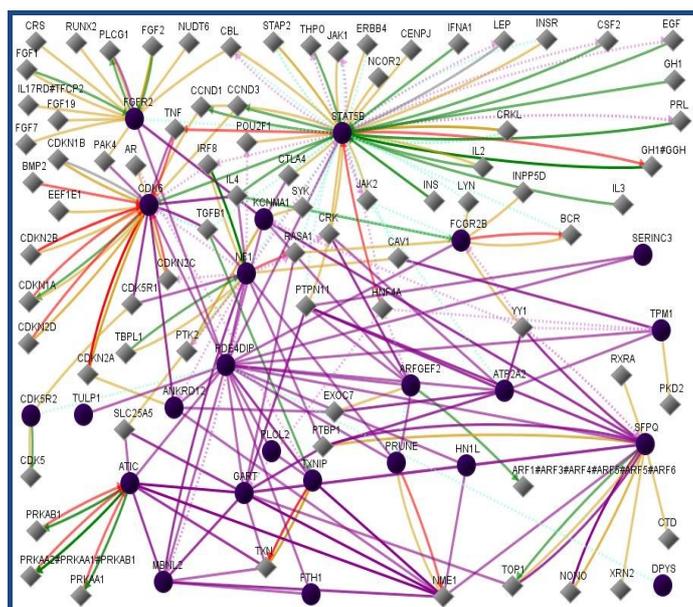


Figure 1: PDE4DIPinteractions. In this figure, line-colors and various interactions with other genes are red Down-regulation, green Up-regulation, beige Regulation, purple Co-expression, brown Physical Interaction, turquoise dotted Predicted Protein Interaction, and mauve dotted Predicted TFactor Regulation. (GenePro SA Biosciences, <http://www.sabiosciences.com/>)
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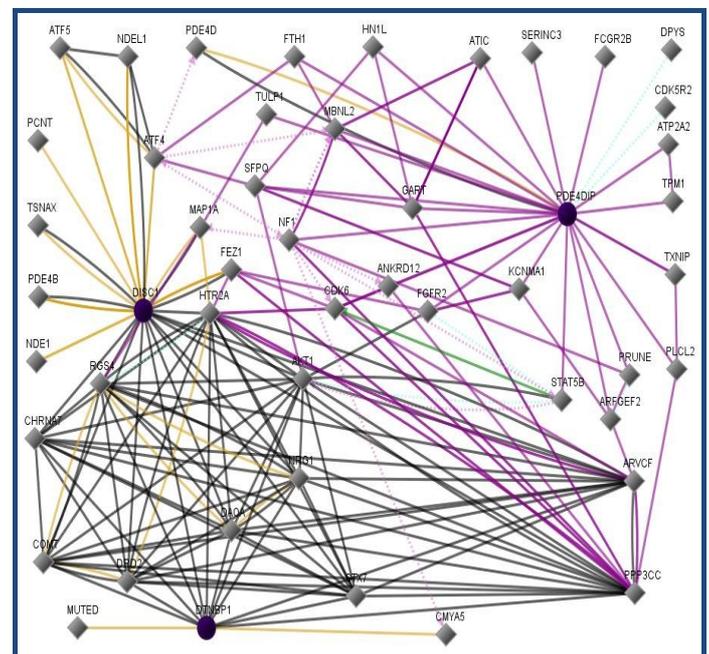


Figure 2: DISC1, DTNBP1, and PDE4DIPinteractions. In this figure, line-colors and various interactions with other genes are red Down-regulation, green Up-regulation, beige Regulation, purple Co-expression, brown Physical Interaction, turquoise dotted Predicted Protein Interaction, and mauve dotted Predicted TFactor Regulation. (GenePro SA Biosciences, <http://www.sabiosciences.com/>).

The use of GenePro SA Biosciences [2] indicates that PDE4DIP interacts with 23 other genes ANKRD12, ARFGF2, ATIC,

ATP2A2, CDK5R2, CDK6, DPYS, FCGR2B, FGFR2, FTH1, GART, HN1L, KCNMA1, MBNL2, NF1, PLCL2, PRUNE, SERINC3, SFPQ, STAT5B, TPM1, TULP1, and TXNIP. When PDE4DIP and the 23 genes are used as input then the output is as shown in **(Figure 1)**. **Figure 1** shows 100 interactions related to PDE4DIP, which is expressed in multiple regions of brain [3].

As a further example illustrating gene product interactions implicated in the disease Schizophrenia, **(Figure 2)** shows interactions between Disrupted in Schizophrenia 1 (DISC1) and dysbindin (DTNBP1) [4]. In addition, PDE4DIP is included [3].

As an exercise, it is suggested for the interested reader to track and categorize the various interacting genes identified in the figures.

Acknowledgment:

There are no financial conflicts.

References:

- [1] <http://www.genecards.org/>
- [2] <http://www.sabiosciences.com>
- [3] Kim S *et al.* *Transl Psychiatry*. 2012 **8**: e113 [PMID: 22832957]
- [4] Camargo LM *et al.* *Mol Psychiatry*. 2007 **12**: 74 [PMID: 17043677]

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