**Practical Session 7: Protein association networks**

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Web links:

Course Material: <https://git.embl.de/hsanchez/unsam_course_2017/tree/master/Session7_Protein_Networks>

UNIPROT: <http://www.uniprot.org>

KEGG: <http://www.kegg.jp/>

STRING: <http://string-db.org>

RCSB: <https://www.rcsb.org/pdb/home/home.do>

ELM: <http://elm.eu.org>

**Retrieving information from IntAct (in Uniprot)**

**Exercise 1:** CRK is an adaptor protein that SH2 and SH3 domains. It is also annotated as a binder of the tyrosine kinase Abl1.

1. What evidence exists that CRK interacts with Abl1?
2. Which domains are involved in the interaction?

**Exercise 2:** CRK has a homolog in flies.

1. Is there a solid evidence that the fly homolog of CRK also interacts with Abl1?

**Exercise 3:** Infer the function of a cluster in a STRING network

1. In the extended network of NCK1, the cluster formed around FGFR1 is annotated in the “Regulation of actin cytoskeleton” but not related to Lamellipodia. Could you infer which molecular function this cluster corresponds to?

**Exercise 4:** Using STRING with a bacterial protein

1. Search htpX from *Brucella abortus.*
2. Show interactions based on experiments and neighborhood. Take a note on which ones have experimental evidence.
3. Look at the Neighborhood view. Are the genes known to interact with htpX with experimental evidence located around the htpX gene?
4. Which evolutionary scenarios can you suggest gave rise to the presence of htpX homologs in some but not all bacteria phyla?

**Exercise 5 (optional):** Using STRING with another bacterial protein

1. Search sipA from *Salmonella enterica* LT2*.*
2. Look at the name of the proteins, is there any pattern?
3. Look at the Neighborhood view. Could you guess what the operon arrangement is in the genomic locus you are observing?