Apoptosis (re)annotation effort

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Background

- The **'cell death'** node was revisited and many changes were made, making the ontology much more granular
  - **183 existing terms** have been **edited**
  - **88 new terms** have been **added**
- As a consequence, terms that are now quite broad have a large number of manual, direct annotations that could be re-housed to more specific terms
  - **1591** annotations to **'apoptotic process'**
  - **4288** annotations to **'regulation of apoptotic process'** and children
  - **861** annotations to **'induction of apoptosis'**
- New terms are still poorly populated

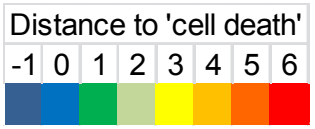
Pilot annotation and enrichment test

- A first annotation effort focused on human proteins involved in apoptosis and displaying protein-protein interactions (IntAct apoptosis dataset)
  - 86 papers were curated
  - 206 apoptosis-relevant gene products were newly annotated
  - 682 new manual annotations were made

- A pilot enrichment analysis based on this dataset yielded promising results

GO enrichment analysis before/after:
Top 20 terms after standard BiNGO analysis

May-11	Jan-13
induction of apoptosis	regulation of execution phase of apoptosis
induction of programmed cell death	regulation of apoptotic process
apoptosis	regulation of cell death
programmed cell death	regulation of programmed cell death
activation of pro-apoptotic gene products	apoptotic signaling pathway
induction of apoptosis by intracellular signals	regulation of cysteine-type endopeptidase activity involved in apoptotic process
positive regulation of apoptosis	positive regulation of cysteine-type endopeptidase activity involved in apoptotic process
cell death	execution phase of apoptosis
positive regulation of programmed cell death	cellular component disassembly involved in execution phase of apoptosis
death	intrinsic apoptotic signaling pathway
positive regulation of cell death	activation of cysteine-type endopeptidase activity involved in apoptotic process
cellular process	extrinsic apoptotic signaling pathway
activation of caspase activity	apoptotic mitochondrial changes
positive regulation of caspase activity	cell-type specific apoptotic process
induction of apoptosis by extracellular signals	extrinsic apoptotic signaling pathway via death domain receptors
regulation of apoptosis	release of cytochrome c from mitochondria
regulation of programmed cell death	glial cell apoptotic process
regulation of cell death	neuron apoptotic process
regulation of caspase activity	neuron death
cellular component disassembly involved in apoptosis	apoptotic DNA fragmentation



Aims

- Targeted (re)curation effort focused on human and mouse
  - Time scale: 1-2 months
- Perform enrichment analysis on human and mouse data
- Submit paper

(Re)annotation strategy

- Provided annotators with apoptosis curation manual to help navigate the new ontology
  - http://wiki.geneontology.org/index.php/Apoptosis_Curation_Manual
- Highlighted annotations that need re-housing, broken down by database
- Compiled a list of papers to curate
- The following agreed to devote resources:
  - UniProtKB (Prudence and Rachael)
  - MGI (David and Li)
  - BHF-UCL (Ruth)
  - Reactome (Lisa)
  - FlyBase (Susan)