Knowledge Graph:
Connecting Big Data Semantics

Ying Ding
Indiana University
Entity in Big Data

- Entity: things, not strings
- Relationship matters: connecting entities
- Changing in searching:
  - string → entity → relation → subgraph
Elinor Ostrom

Economist

Elinor "Lin" Ostrom was an American political economist. She was awarded the 2009 Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, which she shared with Oliver E. Williamson, for ... Wikipedia
Metformin and Ovarian Diseases
Entities

- Entities in social web: person, location, organization, book, music (freebase.com: Metformin)
- Entities in translational medicine: gene, drug, disease, protein, side effect (conceptwiki: Disease Lafora)
- Data: scientific papers (PubMed, PubMed central), and experimental data (SwissPro, KEGG, DrugBank)
PubMed Entities

Antidiabetic drug metformin induces apoptosis in human MCF breast cancer via targeting ERK signaling.

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Abstract

Metformin is the most widely used antidiabetic drug for type II diabetes in the world. Recent studies provide clues that the use of metformin may be associated with reduced incidence and improved prognosis of certain cancers, and there is increasing evidence of a potential efficacy of this agent as an anticancer drug. This observation led us to hypothesize that metformin might inhibit human breast cancer cells (MCF-7) growth. Here, we report that metformin induced apoptosis in human breast carcinoma cell lines MCF-7 cells via novel signaling pathway. Metformin induced apoptosis by arresting cells in G1 phase and reducing cyclin D level and increasing the expression of p21 and cyclin E. Molecular and cellular studies indicated that metformin significantly elevated p53 and Bax levels and reduced STAT3 and Bcl-2. Inhibitors of signaling proteins were used to study the mechanism(s) of metformin function. Receptor inhibitor studies indicated that p53 activation was mediated through insulin receptor (IR), not insulin inhibit. SAPK.


Obesity and insulin resistance in breast cancer--chemoprevention strategies with a focus on metformin.

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Erratum in


Abstract

Obesity and insulin resistance have been associated with breast cancer risk, and breast cancer outcomes. Recent research has focused on insulin as a potential biologic mediator of these effects given frequent expression of insulin/IGF-1 receptors on breast cancer cells which, when activated, can stimulate signaling through PI3K and Ras-Raf signaling pathways to enhance proliferation. Metformin, a commonly used diabetes drug, lowers insulin in non-breast diabetic cancer patients, likely by reducing hepatic gluconeogenesis; it also appears to have potential insulin independent direct effects on tumor cells which are mediated by activation of AMPK with downstream inhibition of mTOR. There is growing epidemiologic, clinical and preclinical (in vitro and in vivo) evidence in keeping with anticancer effects of metformin in breast and other cancers. This has led to the hypothesis that metformin may be effective in breast cancer prevention and treatment. Clinical studies in the neoadjuvant and adjuvant settings are ongoing; additional Phase 2 trials in the metastatic setting and proof of principle studies in the prevention setting are planned.

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Entity Graph

- Heterogeneous Entity Graph
Knowledge Graph Service

**Metformin decreases food consumption and induces weight loss to...**

- A Lee & JH Marley

  Metformin often promotes weight loss in patients with obesity with non-insulin-dependent diabetes ... the effect of metformin on satiety and its efficacy in inducing weight loss. Twelve diet-induced NIDDM women with obesity were randomly given either low levels (650 mg or 1750 mg) of metformin or placebo ... of metformin in inducing bodyweight ... 45 diet-induced NIDDM women with obesity who had failed to lose weight ...

**Metformin and body weight.**

- J Golby

  Most patients with type 2 diabetes are overweight or obese, overweight or obesity increases the risk of developing type 2 diabetes and obesity per se is strongly associated with multiple ... agent, metformin, has been evaluated in hundreds of clinical studies in diverse patient populations during approximately the decades of clinical use. This review summarizes the effects of metformin ...

**Effect of metformin on adipose tissue resistin expression in db...**

- Hioki Fujita & Hirofu Fujihara

  In obesity, To evaluate whether an adipose-resisting drug, metformin, regulates adipose tissue resistance expression, mice models of obesity and diabetes, db/db mice, were treated with metformin (metformin group), insulin (insulin group), and vehicle (control group) for 4 weeks, followed by analyzing ... was decreased by 68% in the metformin group relative to the control group, which did not differ ...
Challenges

• Why we cannot do this via relational databases:
  – There are too many strings not things
  – Relationships and subgraphs, usually they are unknown (so it is hard to join tables if you do not know relationships at first time)

• Why we have to use RDF, ontologies, SW technologies
  – Converting strings to things, using URL to identify/integrate entities (RDF) using common schemas (ontologies)
  – It is too engineering, one consultant job, but there are nontrivial, research does remain (provenance, best practice)

• Creating ConceptWiki is crucial (conceptWiki=Freebase)

• If we do not want to try new things (even it sounds engineering), many wonderful things won’t happen in our current life.