

# TRANSPARENCY TO VISIBILITY (T2V)

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Network Visualization in Humanities Research

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NATIONAL ENDOWMENT FOR THE  
**Humanities**

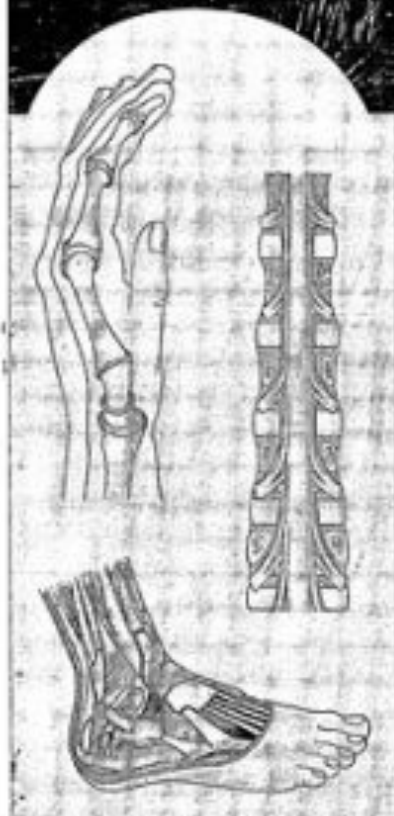
**XSEDE**

Extreme Science and Engineering  
Discovery Environment





# AUSTRALASIAN JOURNAL of BONE & JOINT MEDICINE



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MSD 050.354



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# The Vioxx Story

- Exaggerated Efficacy Findings + Undisclosed Cardiac Events
- 140,000 Cases of Vioxx-induced heart damage
- 61,000 deaths
- \$4.85 billion in legal settlements





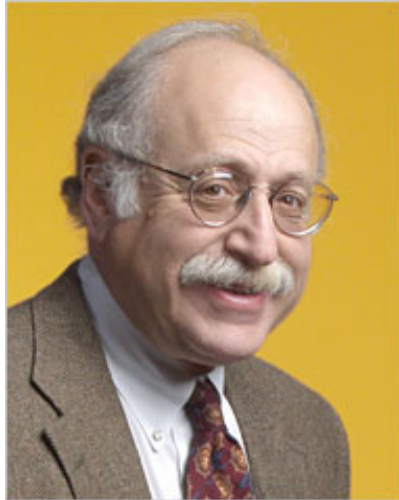
**MERCK**  
Evil Initiatives







“It is simply no longer possible to believe much of the clinical research that is published.”



Use of the word “corruption” [in] the review may be read as implying that Dr. Schatzberg engaged in “bribery” or “other similar dishonest dealings.”



The NEW ENGLAND  
JOURNAL of MEDICINE



**Editor in Chief  
Dr. Marcia  
Angell**

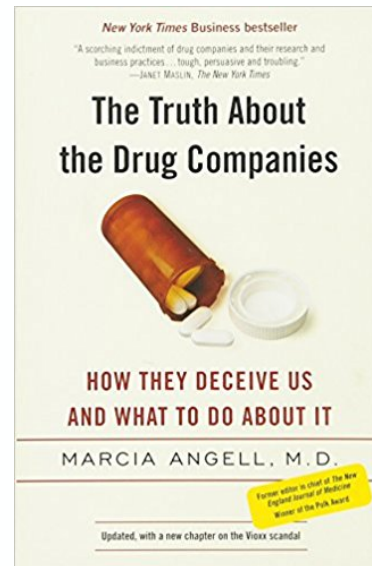
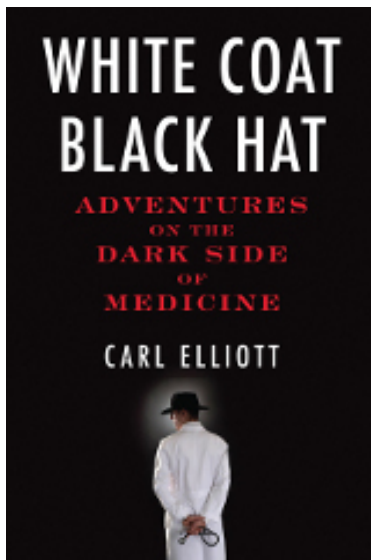
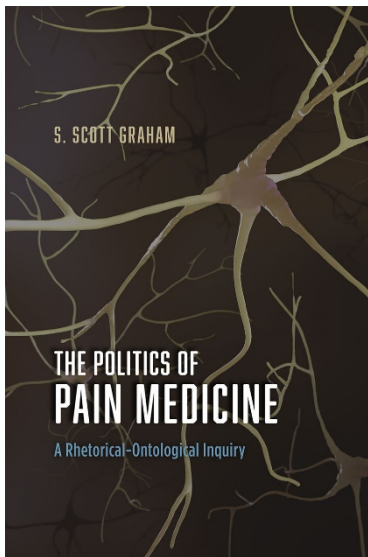


At best, the endless gotcha quest simply ruins some reputations unfairly. But I think it has proven more vicious, creating a cycle in which each story generates more distrust....As reputational costs of exposure grow, everyone works harder at damage control, and fewer people defend themselves, because self-justifications may only intensify the criticism; those who are exposed just hope it will go away quietly. **As the public observes this spiral of blame and shame, the conflict-of-interest movement has paradoxically achieved what it set out to avert: an erosion of public trust in medicine and science.**

Unfortunately, the empirical evidence relevant to financial relationships and conflicts of interest is limited. On many topics related to conflicts of interest, no systematic studies are available. For other topics, data are suggestive rather than definitive.



# Evidence Base



41,000 books and articles addressing  
the “medical-industrial complex”

# Self-Serving Cognitive Bias

- 90% of Americans believe they are better than the average driver
- 16% of medical residents believe they are affected by industry relationships
- 61% of medical **residents** believe their colleagues are affected by industry relationships

# T2V Project Drivers

- Deleterious effects of industry relationships on health and medicine
- Pervasive rejection of critical and humanistic methods
- The challenges of self-serving biases (aka a priori rejection of the villain trope)



# T2V Interventions

- A new conceptual model for conflicts of interest
- A new approach to public argumentation about conflicts of interest
- New digital humanities methodologies to support this work

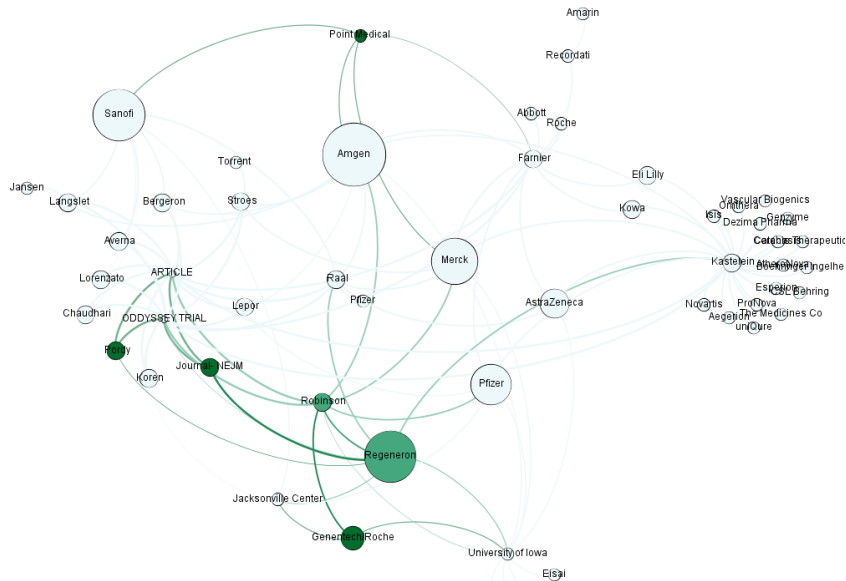
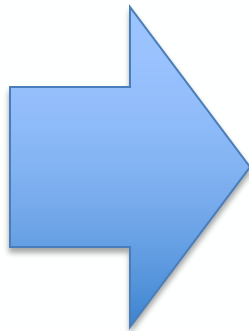
Supported by Sanofi and Regeneron Pharmaceuticals.

Dr. Robinson reports receiving consulting fees from Amgen, Genentech/Roche, Merck, Pfizer, and Regeneron Pharmaceuticals/Sanofi and grant support through her institution from Amarin, Amgen, AstraZeneca, Daiichi-Sankyo, Eisai, Genentech/Roche, GlaxoSmithKline, Merck, Pfizer, Regeneron Pharmaceuticals/Sanofi, and Zinfandel Pharmaceuticals/Takeda. Dr. Farnier reports receiving consulting fees from Amgen, Merck, Sanofi, Abbott, Eli Lilly, Pfizer, AstraZeneca, Roche, Kowa, and Recordati and grant support from Amgen, Merck, and Sanofi. Dr. Bergeron reports receiving fees for serving on advisory boards from Amgen and Sanofi. Dr. Averna reports receiving advisory board fees from Sanofi. Dr. Stroes reports receiving lecture fees from Merck, Amgen, and Torrent Pharmaceuticals. Dr. Langslet reports receiving fees for serving on advisory boards from Amgen, Sanofi-Aventis, and Janssen. Dr. Raal reports receiving fees for serving on advisory boards, lecture fees, and travel support from AstraZeneca, Pfizer, Merck, Amgen, and Sanofi and consulting fees from Amgen and Regeneron Pharmaceuticals/Sanofi. Dr. Koren reports receiving grant support from Regeneron Pharmaceuticals, Sanofi, Roche, and Pfizer. Dr. Lepor reports receiving funds for clinical research from Amgen and Pfizer. Ms. Lorenzato and Dr. Chaudhari report being employees of and holding stock in Sanofi. Dr. Pordy reports being an employee of and holding stock in Regeneron Pharmaceuticals. Dr. Kastelein reports receiving consulting fees from Cerenis Therapeutics, The Medicines Company, CSL Behring, Amgen, Regeneron Pharmaceuticals, Eli Lilly, Genzyme, Aegerion Pharmaceuticals, Esperion Therapeutics, AstraZeneca, Omthera Pharmaceuticals, ProNova, Vascular Biogenics, Boehringer Ingelheim, Catabasis Pharmaceuticals, AtheroNova, uniQure, Novartis, Merck, Pfizer, Isis Pharmaceuticals, Kowa, and Dezima Pharma. No other potential conflict of interest relevant to this article was reported.

- Disclosure statements lead to moral licensing.
- Disclosure statements cause readers to trust research more.
- Disclosure statements are difficult to read/understand.

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Frank Ernst, Peri Barr, and Riad Elmor are employees of Indegene, Inc., which received a fee for services related to the development and execution of this study, and for the tabulation, analysis, and reporting of its results.

Walter Sandulli and Jessica Goldenberg are employees of Akrimax. Arnold Serman has been a consultant for Akrimax, has contributed to research funded by Akrimax, and received an honorarium for his contributions to evaluating this study and to the development of this manuscript.

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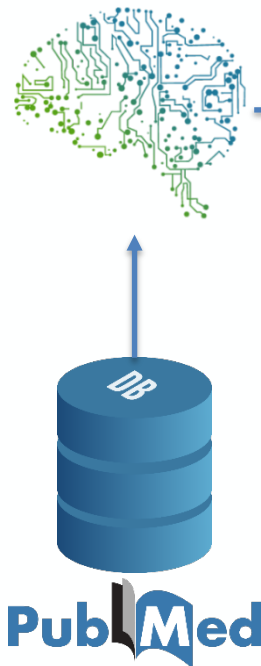
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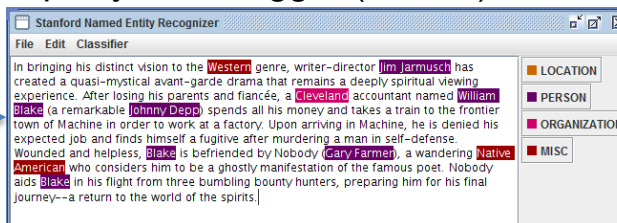


Source	Target	Relationship Type
Indegene, Inc	Frank Ernst	Employment
Indegene, Inc	Peri Barr	Employment
Indegene, Inc	Riad Elmor	Employment
Akrimax	Indegene, Inc	Fee for Services
Akrimax	Walter Sandulli	Employment
Akrimax	Jessica Goldenberg	Employment
Akrimax	Arnold Sterman	Consulting
Akrimax	Arnold Sterman	Grant Funding

- Charles Winchester holds stock in GlaxoSmithKline.
- CE Winchester has equity interests in GSK.
- CEW holds equity shares in Glaxo.
- C.E.W. is a shareholder with GlaxoSmithKline Inc.
- Dr. Winchester has stock options with Glaxo Smith Kline.
- The author holds equity interests with GSK India.



## spaCy NER Tagger (source)



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## Relationship Dictionary

$[^{\wedge}]^*?@[^{\wedge}]^*?\.|^{\wedge}]^*$



## Create Target (Author) Permutations

```
In [4]: author_df['Xavier Aristotle'] = author_df['FirstName']+' '+author_df['LastName']
author_df['X Aristotle'] = author_df['FirstName'].str[0]+' '+author_df['LastName']
author_df['X. Aristotle'] = author_df['FirstName'].str[0]+'.'+' '+author_df['LastName']
author_df['Xavier Bartholomew Aristotle'] = author_df['FirstName'].str.split(' ').str[0]+' '+author_df['LastName']
author_df['Xavier B. Aristotle'] = author_df['FirstName'].str.split(' ').str[0]+' '+author_df['LastName']
author_df['XB Aristotle'] = author_df['FirstName'].str.split(' ').str[0].str[0]+author_df['LastName']
author_df['X.B.A.'] = author_df['FirstName'].str.split(' ').str[0].str[0]+' '+author_df['LastName']
author_df['XBA'] = author_df['FirstName'].str.split(' ').str[0].str[0]+author_df['LastName']
author_df['XA'] = author_df['FirstName'].str[0]+author_df['LastName'].str[0]
author_df['X.A.'] = author_df['FirstName'].str[0]+' '+author_df['LastName'].str[0]+' '
```

- Low Level COI:  $ICC = 0.723$
- Mid Level COI:  $ICC = 0.771$
- High Level COI:  $ICC = 0.617$

# By the numbers

- Articles w/ COI Statements: 274,246
- Low Level COIs: 75,081
- Mid Level COIs: 52,282
- High Level COIs: 25,506
- Total COIs: 152,722
- Average of 1 COI/ 2 articles
- Range: 0 – 294 COIs/article



# Conflict Network Explorer

This app allows you to explore conflicts of interest networks in biomedical publishing. To begin, select a level of granularity and a search for a medical topic. Further details are available at [conflictmetrics.com](https://conflictmetrics.com)

Granularity Level:

Article Level

Name Search:

opioids

PLOT NETWORK

SEARCH HELP

PubMed Citations Matching Search for **opioids** : 18781 ; Citations with COI Data: 102 ; Total Conflicts: 669 ; Journals Involved: 53 ; Authors Involved: 204

Select Layout:

Kamada-Kawai

Filter Nodes by Out-Degree

0

VISUALIZE

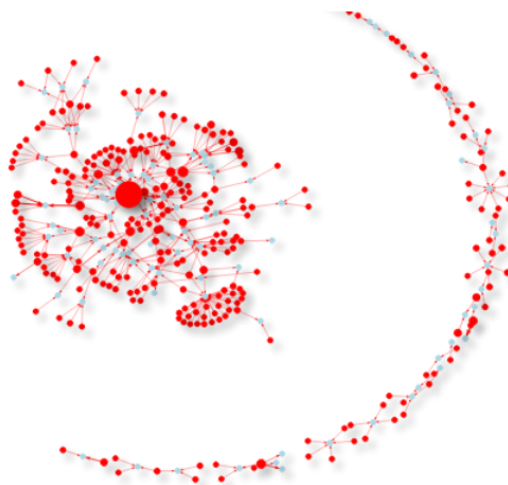
SPONSOR DATA

RECIPIENTS DATA

NETWORK HELP

Industry

Article



## Sponsor Network Explorer

Select network type and product or condition name to plot. **Note:** Some larger data sets may take time to render.

Network Type:

Drug Product Network

Name Search:

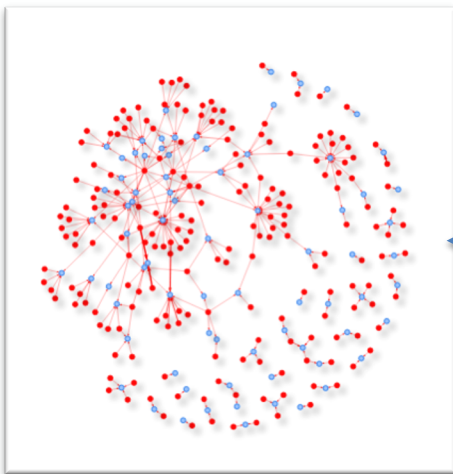
leukemia

PLOT NETWORK

Type to search (ex: leukemia)



T2V



**DIGITAL FRONTIERS 2019**

# TRANSPARENCY TO VISIBILITY (T2V)

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Network Visualization in Humanities Research

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