

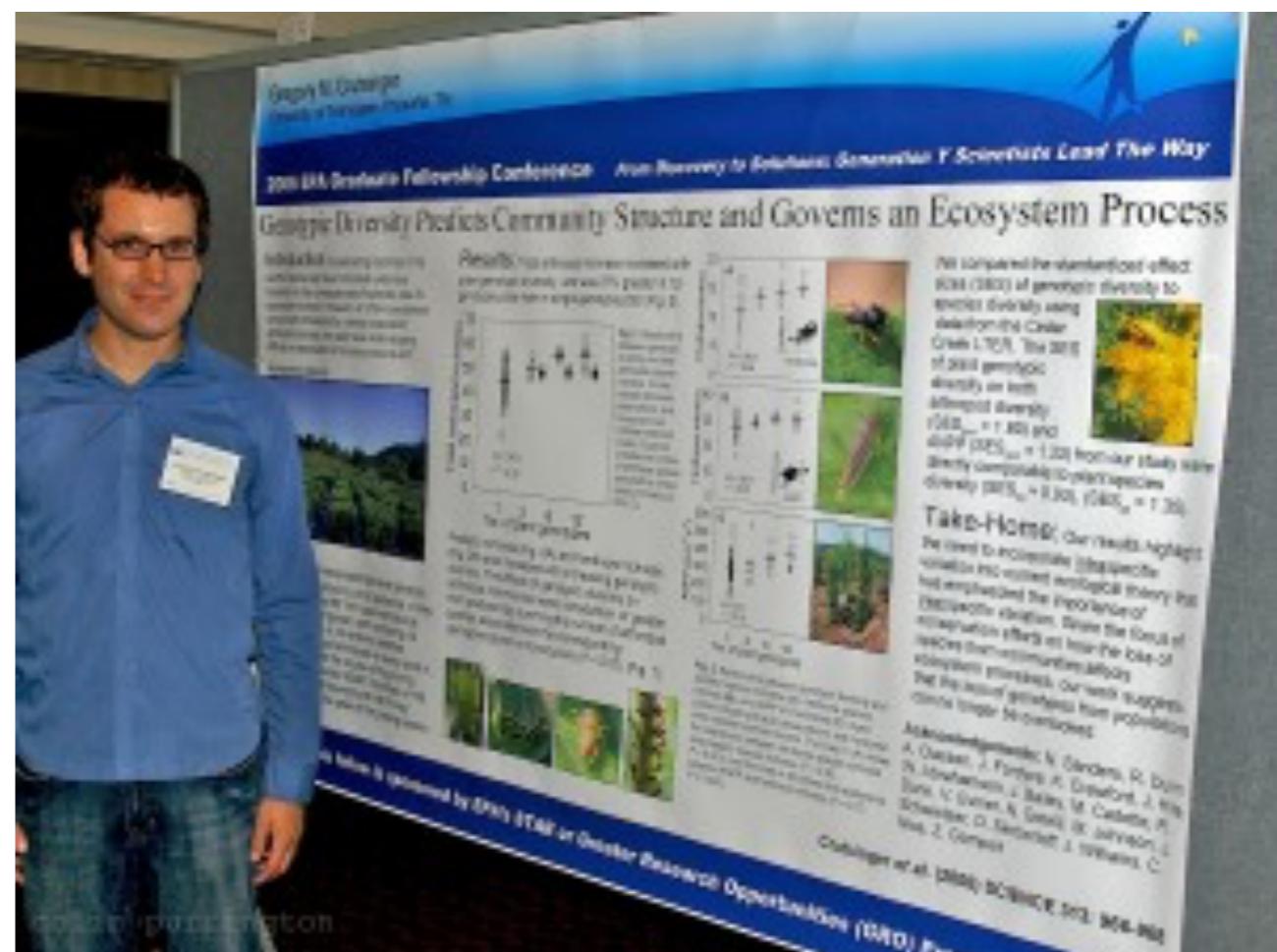
# *scientific* How to make a poster

Anton Dries

12 February 2018

# Outline

- What is a scientific poster?
- Content
- Design
- Examples
- Practical
- Presenting a poster



# Scientific communication

- Three main channels:
  - article
  - presentation (slides)
  - poster
- Other: website, blogs, software, elevator pitch, press release, ...

# Scientific poster

**Goal:**

communicate research while  
hanging on the wall

*standalone*: contain enough information

*extended abstract*: 5 minute story

*attractive*: make passer-by stop and read

# Scientific poster

**Goal:**

communicate research while  
hanging on the wall

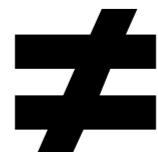
*and you standing next to it*

*standalone*: contain enough information

*extended abstract*: 5 minute story

*attractive*: make passer-by stop and read

# A POSTER



# SLIDES ON THE WALL

**DEclarative Data Generation with ProbLog**

Anton Kraaikamp  
SICST 2015 - Hue, Vietnam

**Motivation**

Empirical science  
e.g. machine learning

Experiment driven

Validate results  
Gain understanding

Real data      Artificial data

**Benefits of artificial data**

- Allows for controlled experiments  
=> analyze behavior
- Ground truth is known  
=> qualitative assessments
- Unrestricted (legal, ethical and commercial)  
=> sharing and reproducibility

**In this work**

- Declarative framework for data generation based on probabilistic logic programming
- Declarative describe database, not the generator
- Declarative: no hidden bias, model is complete description
- First theory of general, based on ProbLog (first-order logic)
- Relational, supports noise, concept drift, wide range of distributions, ...
- Bridges existing interface: ProbLog and ProbLog

**ProbLog**

General purpose programming language based on first-order logic

**Declarative:**  
algorithm = logic + control  
specified by programmer      provided by engine

**Example**

Generate a table of personal information  
( $x \sim \text{gender}(A)$ )

```
0.5: gender(m) :- !.
normal(150, 10); height(X) :- gender(m), !, !.
normal(180, 10); height(X) :- gender(f), !, !.
normal(180, 10); height(X) :- gender(f), !.
normal(180, 10); height(X) :- gender(f), !.
normal(180, 10); height(X) :- gender(f), !.
```

**Example with noise**

```
normal(A) :- noise.
noisy_remap(H) :- !, !.
noiseHeight(H) :- !, !, !.
```

**Example**

- A noise-decorated example
- To generate a dataset, repeat the sampling process

**Structured data – sequences**

```
13-chars([C1-C9], [C10-C13])
12-shoeSize(S) :- S > 1.
```

**Example**

Access the previously generated example  
`previous(Query, Default)`

`sum(Y) :- previous(sum(Y), Y=0).`  
e.g.: keep track of example number  
`query(example_0)`

**Dependencies**

Access the previously generated example  
`previous(Query, Default)`

`sum(Y) :- previous(sum(Y), Y=0).`  
e.g.: keep track of example number  
`query(example_0)`

**More examples**

Concert ticket  
Molecules  
Molecular trees  
Borg problems  
Lorenz system  
...  
<https://www.cs.kuleuven.be/problog/>

**Conclusion**

Declarative framework for data generation based on probabilistic logic programming

- Declarative: describe distribution, no hidden bias
- Expressive: besides logic and arithmetic
- Attribute values, sequences, graphs, sets of facts
- Noise, concept drift, missing values, ...

<https://www.cs.kuleuven.be/problog/>

# Content



# Content

## Title

### Characteristics of Users of the Epilepsy Community of PatientsLikeMe.com and Comparison with a Representative Claims Database

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patientslikeme®

#### Rationale

- PatientsLikeMe<sup>®</sup> is a patient community for people with chronic diseases. It allows users to interact with others sharing their disease experiences and outcomes, and provides a forum for users to compare treatments.
- Hundreds of user posted health problems, discussed by many users, allow patients like myself who are unable to find solutions to common problems with their patients.
- Demographic information available across all the different sub-communities, including clinical, demographic, diagnostic, treatment, side effects, and quality-of-life issues.
- Reported results of PatientsLikeMe<sup>®</sup> participants indicate high levels of engagement with disease management, active discussion, improved quality of life (QOL), and coping with side effects of medications.<sup>1</sup>
- During the initial build of PatientsLikeMe<sup>®</sup>, the developed Epilepsy Community (ELC) was launched in early 2010. The main goals:
  - To provide a safe and voluntary online environment for users to share stories and successes and learn how to manage their own care and treatments.
  - To increase understanding of the disease burden and broader outcomes, and ultimately, self-help tools.
- PatientsLikeMe<sup>®</sup> Epilepsy Community users report more activity, symptom severity, and better QOL than the general population.<sup>2</sup>

#### Objectives:

- To describe the socio-demographic and clinical characteristics of members of the PatientsLikeMe<sup>®</sup> Epilepsy Community.
- To compare the characteristics of the PatientsLikeMe<sup>®</sup> Epilepsy Community with those from the Medical Outcomes Study (MOS) national survey of the US general population after applying

Figure 1. Screenshot of a PatientsLikeMe<sup>®</sup> user's profile from the PatientsLikeMe<sup>®</sup> Epilepsy Community.



#### Methods

##### PatientsLikeMe<sup>®</sup> Epilepsy Community

- The following data were collected by the patients themselves:
  - Demographic info (age, gender, geographic area, race/ethnicity, marital status, education level, income, employment, family history).
  - Health problems (epilepsy, depression, anxiety, pain, hypertension, heart disease, stroke, diabetes, and other medical conditions).
  - Medications (name, type, dose, frequency, side effects).
  - Quality-of-life using physical, emotional, social, and cognitive scales.

The ELC was established in mid-2010. Data from January 2010 to June 2010 were used for this analysis.

- PatientsLikeMe<sup>®</sup> users were asked to provide information on medications they were currently taking.

Individuals missing logging onto the Epilepsy Community less than 30 days were excluded.

- The PatientsLikeMe<sup>®</sup> data were collected independently. This is the first time that the US public will have a repository of diseases from 400 health sites.
- Data collected include age, gender, geographic area, diagnosis, medications, family type and others.

- Participants in the PatientsLikeMe<sup>®</sup> community had been diagnosed with epilepsy (based on self-report). Total 2010 US Disease and Health Profile excluding 200 participants who did not respond, resulted in over 1 million unique patients.

#### Results

##### Patients included in the Analysis

- PatientsLikeMe<sup>®</sup> users (n=1,000) who had been diagnosed with epilepsy and had access to one of their people (year) who had registered to the website, community or blog (n=300).
- PatientsLikeMe<sup>®</sup> 300 patients with epilepsy.

##### Table 1. Patient Characteristics

Characteristic	PatientsLikeMe <sup>®</sup> (n=300)	General Population (n=1,000)
Age (years, median)	36	49 (17-83)
Gender, %	224 (74.7)	532 (53.2)
Marital status	221 (73.7)	711 (71.1)
Higher education	221 (73.7)	133 (13.3)
Employment	162 (54.0)	366 (36.6)
Family history	227 (75.7)	240 (24.0)
Diabetes mellitus	209 (70.0)	100 (10.0)
Hypertension	144 (48.0)	100 (10.0)

- Demographic information on age, gender, race, ethnicity, marital status, education level, and income were collected.
- The average age was 36 years from PatientsLikeMe<sup>®</sup> (Table 1) though the difference in age did not reach statistical significance (Figure 2).
  - Compared with PatientsLikeMe<sup>®</sup> the PatientsLikeMe<sup>®</sup> Epilepsy Community has a greater proportion of females (female:males ratio values based on mean compared difference).

#### Figure 2. Age Comparison

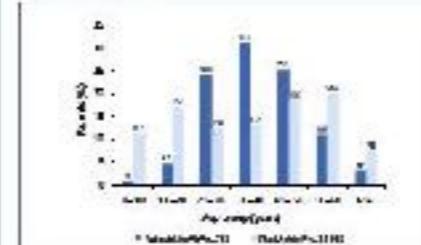


Figure 2. Age Comparison  
PatientsLikeMe<sup>®</sup> (n=300) vs General Population (n=1,000).

#### Figure 3. Number of Antiepileptic Drugs (AEDs)

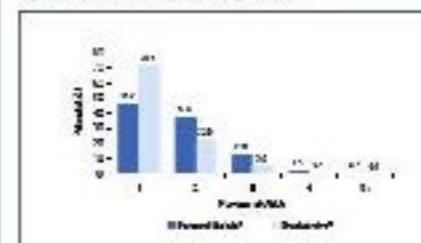


Figure 3. Number of Antiepileptic Drugs (AEDs)  
PatientsLikeMe<sup>®</sup> (n=300) vs General Population (n=1,000).

- A greater proportion of patients in the PatientsLikeMe<sup>®</sup> community were treated with one or two generic AEDs (40% each vs 17.4% and 14.7% for the ELC and 7.1% in the general public in their 30s and 40s from the MOS).
- A similar proportion of patients from PatientsLikeMe<sup>®</sup> were treated with four or more AEDs (20.0% compared to 11.6% in 30s, 10.6% in 40s, 12.0% in 50s, 14.0% in 60s vs 11.4% compared with generic AEDs from the MOS).

#### Addendum: Results from PatientsLikeMe<sup>®</sup> data on Antiepileptic Medications

##### Diagnosis

- Most patients with epilepsy from PatientsLikeMe<sup>®</sup> had a diagnosis of the disease (95.6%), with a smaller subset being diagnosed with seizures using non-electroencephalogram (EEG) and computed tomography (CT) scan.
- Most PatientsLikeMe<sup>®</sup> users with epilepsy (81.6%) had a single diagnosis of epilepsy, whereas 18.4% had multiple diagnoses (epilepsy plus another condition).

Most PatientsLikeMe<sup>®</sup> users with epilepsy (81.6%) had a single diagnosis of epilepsy, whereas 18.4% had multiple diagnoses (epilepsy plus another condition).

#### Table 2. Aggregate Demographic Information from PatientsLikeMe<sup>®</sup> Community

Characteristic	PatientsLikeMe <sup>®</sup> (n=300)	General Population (n=1,000)
Education level	224 (74.7)	532 (53.2)
Employment	162 (54.0)	366 (36.6)
Family history	227 (75.7)	240 (24.0)
Diabetes mellitus	209 (70.0)	100 (10.0)
Hypertension	144 (48.0)	100 (10.0)

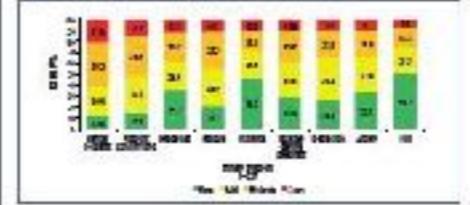
##### Demographics

- The most frequently reported co-morbidities were diabetes (24.0%, 70.0%), obesity (18.0%, 60.0%), and hypertension (20.0%, 60.0%).

##### Severity of Primary Symptoms

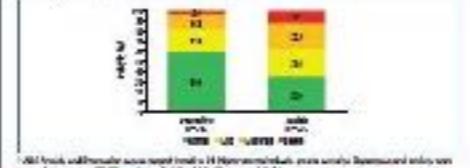
- PatientsLikeMe<sup>®</sup> users reporting of the severity of pain, mild, moderate, severe or very severe were mostly provided with valtrex (Figure 4).
- The most frequently reported severe symptoms in the community were pain (21.7%, 21.8%), confusion (14.2%, 14.2%), and headache (16.0%, 16.0%).

Figure 4. Severity of Primary Symptoms at First Evaluation



- As measured by MOS, the proportion of patients with moderate or severe pain (21.7% vs 14.2%) was higher than the proportion of all moderate severe severe depressive (16.0% vs 16.0%, Figure 5).

Figure 5. Severity of Depression and Anxiety (MOS vs The Epilepsy Society and Epilepsy Foundation (EF) 2009)



MOS finds additional severe report from 21.7% patients while the MOS finds 16.0% severe report from 16.0% patients.

#### Discussion

- PatientsLikeMe<sup>®</sup> is a representative of the general population in terms of both socio-demographic and gender involvement in their treatment. This is because no one is represented by the entire community.
- PatientsLikeMe<sup>®</sup> users appear to provide specific information related to their own personal experience rather than generalities of patients. Though each database has its own selection bias.

- The main advantage of PatientsLikeMe<sup>®</sup> is that it is easier to use for the patient perspective. In addition, a built-in system of protection and transparency can be developed and used for real-world research. This will facilitate the use of PatientsLikeMe<sup>®</sup> as a tool for improving the quality of life of patients, supporting informed patients and their families.
- The main advantage of PatientsLikeMe<sup>®</sup> is that it is a platform for collection of subjective information. Only one participant of the study can use the platform. This is because of the nature of the disease and the need for individualized care.

#### Conclusions

- Approximately 10% of PatientsLikeMe<sup>®</sup> users are users that co-exist with PatientsLikeMe<sup>®</sup>. The PatientsLikeMe<sup>®</sup> Epilepsy Community adds to the perspective of patients with epilepsy.
  - Pain.
  - Anxiety.
  - Depression.
  - Headache.
- The data from the PatientsLikeMe<sup>®</sup> Epilepsy Community provides the general characteristics of those users willing to share details.
- User numbers for PatientsLikeMe<sup>®</sup> are expected to increase substantially as it becomes more popular. This will facilitate the generalization of the PatientsLikeMe<sup>®</sup> Epilepsy Community will be generalized to multiple other diseases. This will be a large set of patients and associated health data that can be used to develop new tools and techniques to improve the quality of life of the disease burden of the underlying problem.

##### Author's Note

1. Kellman J, Hwang W, et al. J Neurology. 2009;266(1):10-16.
2. PatientsLikeMe. Study 10: Epilepsy. 2010;10:1-10.
3. Kellman J, Hwang W, et al. J Neurology. 2009;266(1):10-16.
4. PatientsLikeMe. The PatientsLikeMe Epilepsy Community Data Report. 2010;10:1-10.

##### References

1. Kellman J, Hwang W, et al. J Neurology. 2009;266(1):10-16.
2. PatientsLikeMe. Study 10: Epilepsy. 2010;10:1-10.
3. Kellman J, Hwang W, et al. J Neurology. 2009;266(1):10-16.
4. PatientsLikeMe. The PatientsLikeMe Epilepsy Community Data Report. 2010;10:1-10.

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# Content

## Authors

Christine de la Luge<sup>1</sup>, Dorothy Koeniger<sup>1</sup>, Jouko Isajevi<sup>2</sup>, Michael P. Massagli<sup>3</sup>, Paul Wicks<sup>4</sup>, Iude Mihai<sup>5</sup>, Brussels, Belgium; iQDev Inc., Holbrook, NC, United States; Phescent and Development, Houston, TX, Cambridge, MA, United States

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### patientslikeme™

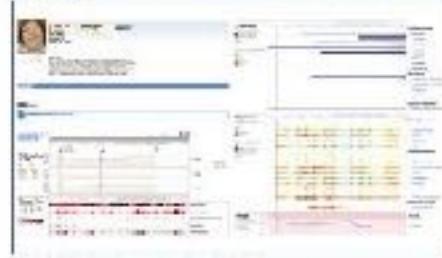
#### Rationale

- PatientsLikeMe<sup>®</sup> is a patient community for people with life-changing diseases that is run entirely by patients who share their disease experiences and outcomes, and work hard to improve their own care and those of others.
- Hundreds of user-created online forums, moderated by experienced users, answer users' questions about solutions to common problems with their patients.
- PatientsLikeMe<sup>®</sup> has over 100,000 registered users from 100+ countries, 1,000+ diseases, 100+ clinical conditions, 100+ symptoms, multiple organ systems, 1,000+ disease and progression stages, and much more.
- Reported results of PatientsLikeMe<sup>®</sup> participants indicate high levels of engagement with disease management, better adherence, improved quality of life (QoL), and reduced side effects of medications.<sup>1</sup>
- During the initial build of PatientsLikeMe<sup>®</sup>, the developed fit perfectly with EDS, was invited to be a beta test in January 2010. The main goals were:
  - To provide a safe and voluntary place for patients to share their stories and successes and ways to approach their care and their medications.
  - To increase understanding of health issues among healthcare professionals, and their家人 and self-care.
- PatientsLikeMe<sup>®</sup> is the PatientsLikeMe<sup>®</sup> PatientsCommunity created to address many important topics, including data collection, treatment options, and cost of living, that define the needs of today's patients.

#### Objectives:

- To describe the socio-demographic and clinical characteristics of members of the PatientsLikeMe<sup>®</sup> PatientsCommunity.
- To compare the characteristics of the PatientsLikeMe<sup>®</sup> PatientsCommunity with those from the PatientsLikeMe<sup>®</sup> online patient community of the EDS patient advocacy organization, MyEDS.org.

Figure 1. Comparison of a PatientsCommunity and a PatientCommunity PatientsCommunity.



#### Methods

##### PatientsLikeMe<sup>®</sup> PatientsCommunity

- The following data were collected by the patients themselves:
  - Demographics (age, gender, geographic area, smoking status)
  - Diagnoses
  - Number of symptoms experienced
  - Diagnosis score
  - Severity of drug using physician
  - Co-morbidities
  - Other question(s) for medical or pharmaceutical professionals

The following additional information was collected through PatientsLikeMe<sup>®</sup> Data:

- PatientsLikeMe<sup>®</sup> PatientsCommunity members are a subset of patients who contribute to the site.
- Improvement: patients logging onto the PatientsLikeMe<sup>®</sup> PatientsCommunity each day, week, month.

#### Participants

- The PatientsLikeMe<sup>®</sup> PatientsCommunity dashboard includes 1,000+ from 100+ countries, with a wide variety of diseases from 100+ health plans.
- Data collected include age, gender, geographic area, diagnosis, comorbidities, health plan type and status.
- Reported: Patients in the PatientsLikeMe<sup>®</sup> PatientsCommunity have been diagnosed with: asthma (10%), fibromyalgia, rheumatoid arthritis, osteoporosis and fibromyalgia. Patients reporting living with 25+ medical issues, mostly chronic from their dashboard.

#### Results

##### Patients included in the Analysis

- PatientsLikeMe<sup>®</sup> PatientsCommunity users who have been diagnosed with epilepsy and had access to one of their people (adults) who had registered to the PatientsLikeMe<sup>®</sup> PatientsCommunity.
- PatientsLikeMe<sup>®</sup> 30,000 patients with epilepsy.

##### PatientsLikeMe<sup>®</sup> PatientsCommunity

Demographic Information	Demographic	Demographic
Age group, median	36	40.0 (18-72)
Gender, n (%)	224	50.2 (112/224)
Disease, n (%)	221	50.1 (111/221)
Total users, n (%)	221	50.1 (111/221)
Active participation, n (%)	143	32.7 (61/143)
Non-constant visitors, n (%)	127	28.5 (30/127)
Logins per day, median	2.0	2.0 (0-10)

- Demographic information of patients with epilepsy from the PatientsLikeMe<sup>®</sup> PatientsCommunity:
  - The average age was 36 for patients from PatientsLikeMe<sup>®</sup> PatientsCommunity (Table 1). There is no difference in age than older women (Table 2).
  - Compared with PatientsLikeMe<sup>®</sup> in the PatientsLikeMe<sup>®</sup> PatientsCommunity, a greater proportion of patients were female, less than some patients had more co-morbid disease.

#### Figure 2. Age Distribution

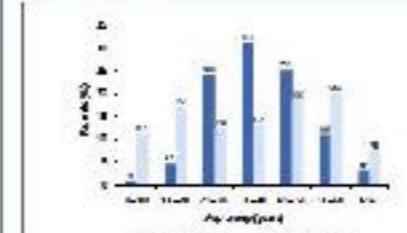


Figure 2. Age Distribution  
Number of PatientsLikeMe<sup>®</sup> PatientsCommunity members by age group.

#### Figure 3. Number of Antiepileptic Drugs (AEDs)

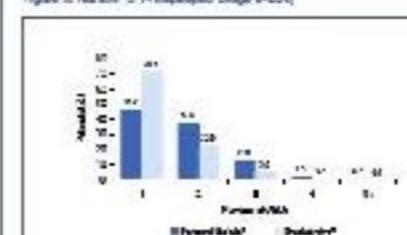


Figure 3. Number of Antiepileptic Drugs (AEDs)  
Number of PatientsLikeMe<sup>®</sup> PatientsCommunity members taking 0-6+ AEDs.

#### Figure 4. Diagnoses by Disease Area: PatientsLikeMe<sup>®</sup> Community



#### Demographics

- The most frequently reported co-morbidities were arthritis (74.0%, 104/140), anxiety (64.3%, 85/131), and major depressive disorder (60.4%, 101/168).

#### Symptoms or Primary Complaints

- PatientsLikeMe<sup>®</sup> observed reporting of the following symptoms: cold, weakness, loss of memory, headache, memory problems associated with epilepsy (Figure 5).
- The most frequently reported symptom reported was memory problems (61.7%, 21/34.6), followed by pain (60.6%, 14/23.5) and headache (60.6%, 12/34.6).

Figure 4. Diagnoses by Disease Area: PatientsLikeMe<sup>®</sup> Community

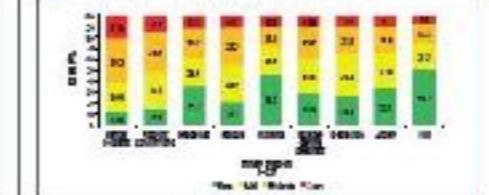


Figure 5. Symptoms or Primary Complaints: PatientsLikeMe<sup>®</sup> Community

#### Figure 6. Demographic Information: PatientsLikeMe<sup>®</sup> PatientsCommunity

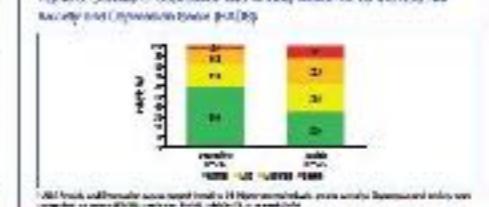


Figure 6. Demographic Information: PatientsLikeMe<sup>®</sup> PatientsCommunity

#### Discussion

- Patients who create content in PatientsLikeMe<sup>®</sup> and interact with those with similar knowledge and greater involvement in their treatment. This patients may act as representatives of the wider epilepsy population.

##### PatientsLikeMe<sup>®</sup> PatientsCommunity

- The main advantage of PatientsLikeMe<sup>®</sup> is that it allows for the patients perspective, in addition, a wide variety of procedures and treatments information can be reviewed and evaluated by a patient themselves, without the need for a healthcare provider to translate the medical jargon, improve informed consent and reduce costs.

- The main advantage of PatientsLikeMe<sup>®</sup> is the potential reduction of subjective perceptions. Only an open example of the findings can be used for patients to make informed decisions, obtain clarity and reduce uncertainty, to determine the safety and effectiveness of the therapy, outcome, improvement and the cost of treatment.

#### Conclusions

- Analysis of the community revealed that there were no significant associations with PatientsLikeMe<sup>®</sup> in the PatientsLikeMe<sup>®</sup> PatientsCommunity for the following characteristics of patients with epilepsy:
  - Female
  - Aged 40-49 years
  - Painful episodes
  - Headache under 40%

##### PatientsLikeMe<sup>®</sup> PatientsCommunity

- The data found from PatientsLikeMe<sup>®</sup> demonstrates the general characteristics of those users willing to share details.

- User numbers of PatientsLikeMe<sup>®</sup> are expected to increase substantially as it becomes more popular in the epilepsy community, the accessibility of information to PatientsLikeMe<sup>®</sup> PatientsCommunity will be increased as more people log on. This year, the large use of patients and associated health of individuals will be reflected in the growth of the disease burden of the underlying condition.

#### Author biography

Christine de la Luge is a Researcher at the Institute of Biostatistics and Medical Informatics (IBMI) at the University of Cologne, Germany and a Senior Lecturer at the School of Business Administration, Economics and Law, University of Cologne, Germany. She is a member of the Research Group "Health Information Systems".

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# Content

**Characteristics of Users of the Epilepsy Community of PatientsLikeMe.com and Comparison with a Representative Claims Database**

Christine de la Luge<sup>1</sup>, Dorothy Keninger<sup>1</sup>, Jouko Isajenvi<sup>1</sup>, Michael P. Massagli<sup>2</sup>, Paul Wicks<sup>3</sup>, Iude Mihai<sup>4</sup>, Brussels, Belgium; iudeM Inc., Holbrook, NC, United States; Phesachit and Development, HousenSLKeras Inc., Cambridge, MA, United States

1.005

**patientslikeme\***

**Rationale**

- PatientsLikeMe<sup>®</sup> is a patient community for people with chronic diseases. It allows users to interact with other patients to share their disease experiences and outcomes, and even how to improve their own care by comparing experiences.
- Healthcare professionals can benefit greatly by interacting with patients' self-reported data and using this information to better serve their patients.
- PatientsLikeMe<sup>®</sup> has been used to compare patients across different medical specialties, including neurology, psychiatry, cardiology, oncology, rheumatology, and organ transplantation, to monitor disease progression, and to evaluate safety.
- Reported results of PatientsLikeMe<sup>®</sup> publications include high levels of agreement with clinical management, either clinically improved quality of life (QoL), and/or with side effects of medications.<sup>1</sup>
- During the initial build of PatientsLikeMe<sup>®</sup>, the developed fit predominantly with ICD-9, was found to fit ICD-10 very well. The main goals are:
  - To provide tools for people with epilepsy to share their stories of treatment and success, and ways to approach their own care and peer interactions.
  - To increase understanding of epilepsy among health care providers and their家人, and self-care.
- PatientsLikeMe<sup>®</sup> Epilepsy Community includes more than 10,000 users from 40 countries, representing 100+ countries. The cost of developing this feature was approximately \$100,000.

**Objectives:**

- To describe the socio-demographic and clinical characteristics of members of the PatientsLikeMe<sup>®</sup> Epilepsy Community.
- To compare the characteristics of the PatientsLikeMe<sup>®</sup> Epilepsy Community with those from the Medical Outcomes Study (MOS) population representative of the US non-institutionalized population with epilepsy.

**Methods**

**PatientsLikeMe<sup>®</sup> Epilepsy Community**

- The following data were collected by the patients themselves:

Questionnaire item	Longest answer
- Demographic info, gender, geographic area, marital status	- Disease history
- Epilepsy	- Disease severity
- Diagnosis	- Symptoms
- Medication	- Treatments
- Side effects	- Side effects
- ICD-10 Epilepsy and Epileptiform disorders	- ICD-10 Epilepsy and Epileptiform disorders
- Self-care	- Other questions not in specific ICD-10 categories

The MOS data included individuals between 18-64 years old from the US. The main goals are:
 

- To provide tools for people with epilepsy to share their stories of treatment and success, and ways to approach their own care and peer interactions.
- To increase understanding of epilepsy among health care providers and their家人, and self-care.

**Participants**

- The PatientsLikeMe<sup>®</sup> data were collected via the PatientsLikeMe<sup>®</sup> website from 100 countries, and will be updated quarterly from 400 health plans.
- Data collected include age, gender, geographic area, diagnosis, prescriptions, health plan type and others.
- Population: Patients in the PatientsLikeMe<sup>®</sup> Epilepsy Community have been diagnosed with epilepsy (International Classification of Diseases and Related Health Problems coding beginning with 350, 351, 352, 353, 354, 355, 356, 357, 358, 359).

**Measurements**

**Figure 1. Comparison of PatientsLikeMe<sup>®</sup> vs. PatientsLikeMe<sup>®</sup> Epilepsy Community**

**Figure 2. Age distribution**

Age Group	Number of Users
18-24	~15
25-34	~25
35-44	~75
45-54	~85
55-64	~65
65-74	~45
75-84	~25
85-94	~15

**Figure 3. Number of Antiepileptic Drugs (AEDs)**

Number of AEDs	Number of Users
0	~10
1	~25
2	~45
3	~35
4	~25
5	~15
6	~10
7	~5
8	~5

**Figure 4. Prevalence of Primary Symptoms at First Evaluation**

Primary Symptom	0%	25%	50%	75%	100%
Seizure	~10	~20	~30	~40	~50
Confusion	~10	~20	~30	~40	~50
Fall	~10	~20	~30	~40	~50
Memory loss	~10	~20	~30	~40	~50
Weakness	~10	~20	~30	~40	~50
Headache	~10	~20	~30	~40	~50
Depression	~10	~20	~30	~40	~50
Blurry vision	~10	~20	~30	~40	~50
Stiffness	~10	~20	~30	~40	~50
Loss of balance	~10	~20	~30	~40	~50
Itching	~10	~20	~30	~40	~50
Weakness in legs	~10	~20	~30	~40	~50
Loss of coordination	~10	~20	~30	~40	~50
Loss of appetite	~10	~20	~30	~40	~50
Loss of taste	~10	~20	~30	~40	~50
Loss of smell	~10	~20	~30	~40	~50
Loss of hearing	~10	~20	~30	~40	~50
Loss of touch	~10	~20	~30	~40	~50
Loss of pain	~10	~20	~30	~40	~50
Loss of reflexes	~10	~20	~30	~40	~50
Loss of muscle tone	~10	~20	~30	~40	~50
Loss of strength	~10	~20	~30	~40	~50
Loss of coordination	~10	~20	~30	~40	~50
Loss of balance	~10	~20	~30	~40	~50
Loss of reflexes	~10	~20	~30	~40	~50
Loss of strength	~10	~20	~30	~40	~50
Loss of coordination	~10	~20	~30	~40	~50
Loss of balance	~10	~20	~30	~40	~50
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Loss of strength	~10	~20	~30	~40	~50
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Loss of coordination	~10	~20	~30	~40	~50
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Loss of reflexes	~10	~20	~30	~40	~50
Loss of strength	~10	~20	~30	~40	~50</





# Content

16



# Content

**Characteristics of Users of the Epilepsy Community of PatientsLikeMe.com and Comparison with a Representative Claims Database**

Christine de la Luge<sup>1</sup>, Dorothy Keninger<sup>1</sup>, Jouko Isajevi<sup>2</sup>, Michael P. Massagli<sup>3</sup>, Paul Wicks<sup>4</sup>, Iude Mihai<sup>5</sup>, Brussels, Belgium; iCub Inc., Holbrook, NC, United States; Phesachit and Development, HousenSLKeara Inc., Cambridge, MA, United States

1.005

**patientslikeme\***

**Rationale**

- PatientsLikeMe<sup>®</sup> is a patient community for people with chronic diseases. It allows users to interact with others sharing their disease experiences and outcomes, and provides them with support from their peer community.
- Hundreds of user-trusted health professionals, curated by an exclusive panel, answer user questions, offer solutions to common problems with other patients.
- PatientsLikeMe<sup>®</sup> has over 100,000 registered users with over 100,000 unique epilepsy diagnoses, 1,100 medications, 4,000 symptoms, multiple organ systems, 1,000+ user-defined conditions, and progressive disease under study.
- Reported results of PatientsLikeMe<sup>®</sup> participants include high levels of engagement with disease management, active adherence, improved quality of life (QoL), and reduced side effects of medications.<sup>1</sup>
- Based on the initial build of PatientsLikeMe<sup>®</sup>, the developed by patients with epilepsy, users have reported a 20% reduction in QoL, with users reporting:
  - The availability of people with epilepsy who can discuss symptoms and treatment options and to increase their own care-peer interactions.
  - The increased knowledge of their disease, better medication adherence, and their ability to self-treat their disease.
- PatientsLikeMe<sup>®</sup> Epilepsy Community users report higher levels of engagement with disease management, active adherence, improved quality of life (QoL), and reduced side effects of medications.<sup>2</sup>

**Methods**

**PatientsLikeMe<sup>®</sup> Epilepsy Community**

- The following table summarizes the patient characteristics:

Characteristic	Description
Number of users (n=100)	Longitudinal data:
- Demographic (age, gender, geographic area, race/ethnicity)	- Disease severity
- Epilepsy type	- Symptoms
- Diagnostic history	- Treatments
- Medications used	- Side effects
- Experience of drug using physician	- PEGI: Patient-Physician Interaction Questionnaire (for medical providers)
- Co-morbidities	

The following table summarizes the patient characteristics:

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- Experience of drug using physician	- PEGI: Patient-Physician Interaction Questionnaire (for medical providers)
- Co-morbidities	

**Figure 1: Age Distribution**

**Figure 2: Age Distribution**

**Figure 3: Number of Antiepileptic Drugs (AEDs)**

**Figure 4: Disease**

Disease	Percentage
Epilepsy	100%

**Figure 5: Disease**

Disease	Percentage
Epilepsy	100%

**Figure 6: Disease**

Disease	Percentage
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**Figure 7: Disease**

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**Figure 11: Disease**

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**Figure 12: Disease**

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**Figure 13: Disease**

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**Figure 14: Disease**

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**Figure 15: Disease**

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**Figure 16: Disease**

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**Figure 18: Disease**

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**Figure 99: Disease**

Disease	Percentage
Epilepsy	100%

**Figure 100: Disease**

Disease	Percentage
Epilepsy	100%





# Sections

- Title
- Authors
- Abstract
- Motivation
- Problem
- Background
- Approach
- Experiments
- Conclusion
- Related Work
- Acknowledgments
- References

# Sections

- Title
  - Approach
- Author information
  - Should be informative
  - Put it at the top
- Methods
  - Largest font size – at most two lines
- Results
  - References
- Background

# Sections

- Title
- Approach
- **Authors**
  - Who to contact?
  - Include all authors (you could mark your name if you are presenting)
- Motivation
- Problem
- Add affiliation logos
- Background
  - For thesis / project posters: put supervisor / advisor separately

# Sections

- Title
- Authors
- **Abstract**
  - Don't include an abstract – your poster *is* an abstract
  - You could add a tagline, a oneliner describing what you are doing
- Approach
- Experiments
- Conclusion

# Sections

- Title
- Authors
- Abstract
- **Motivation**
  - Place your research in a broader context
  - Explain why the reader should be interested
- Problem
- Background
- Approach
- Experiments
- References

# Sections

- Title
- Authors
- Abstract
- Motivation
- **Problem**
- Background
- Approach
- Give a clear description of the problem you are solving
- What is the given? What is the outcome?
- Acknowledgments
- References

# Sections

- Title
  - Author
  - Abstract
  - Motivation
  - Problem
  - Approach
  - References
- Give sufficient background information, not everybody might be familiar with your domain
- Briefly describe research you built on
- Background

# Sections

- Title
- Authors
- Abstract
- Motivation
- Approach
  - Main section of the poster
  - How did you solve the problem?
- Problem
- Background
- Acknowledgments
- References

# Sections

- Title
- Authors
- Abstract
- Motivation
- Problem
- Background
- Approach
- **Experiments**
- Evaluation of your approach
- Use graphs and figures
- Discuss the results
- References

# Sections

- Title
- Authors
- Abstract
- Motivation
- Problem statement
- Background
- Approach
- Experiments
- **Conclusion**
  - Draw conclusions
  - Discuss future work
  - Should complement motivation & problem description

k  
ments

# Sections

- Usually not needed
- Work you build on should be in background
- Could list alternative methods for solving same problem
- Motivation
- Problem
- Background
- **Related Work**
- Acknowledgments
- References

# Sections

- Title
- Authors
  - Thank people, funding agencies
  - For thesis / project, could be the place to mention promotor / advisors
- Abstract
- Motivation
- Problem
  - **Acknowledgments**
- Background
  - References

# Sections

- Title
- Authors
  - Only references that are really relevant
- Abstract
  - Usually two or three, at most five
- Motivation
  - Refer to own paper (unless it is published at the conference you are presenting the poster)
- Problem
- Background
- **References**

# Sections

- **Title**
- *Authors*
- ~~Abstract~~
- **Motivation**
- **Problem**
- *Background*
- **Approach**
- *Experiments*
- **Conclusion**
- ~~Related Work~~
- Acknowledgments
- References

# Sections

- **Title**
- **Approach**

**But it all depends on your poster's topic.**

- e.g. you don't have experiments
- e.g. your research is motivated by an application / purely theoretical

- *Background*

- References

# Design

# Design

*Some simple rules:*

Leave some white space

Visually separate sections

Use color and size to mark important things

Use visual elements: boxes, figures and pictures

Don't use full sentences and paragraphs

Make sure there is a clear flow

**Layout should support the message**

# Design

## Quantitative pheno-proteomics of inhibitor-treated *Plasmodium falciparum* schizonts reveals protein kinase G-dependent phosphorylation of Myosin A serine 19

Christian Fleck<sup>1</sup>, Lev Solyanikov<sup>2</sup>, Mahmood Alim<sup>3</sup>, Andrew Boltrill<sup>4</sup>, Shered Misra<sup>5</sup>, Judith L. Green<sup>4</sup>, Christine S Hogg<sup>1</sup>, Anthony A Holder<sup>4</sup>, Andrew Tobin<sup>5</sup>, David A Baker<sup>1</sup>



wellcome trust

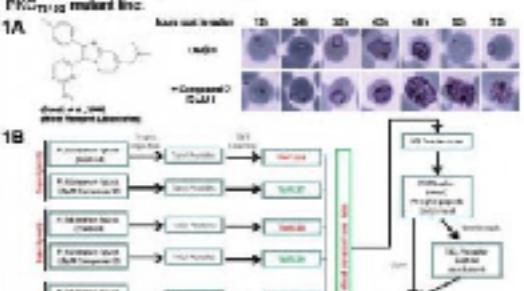
<sup>1</sup>LSHTM, London School of Hygiene and Tropical Medicine, London, United Kingdom  
<sup>2</sup>MRC Biostatistics Unit, University of Cambridge, Cambridge, United Kingdom  
<sup>3</sup>Division of Parasitology, MRC National Institute for Medical Research, Mill Hill, London

### Introduction

Cyclic guanosine monophosphate (cGMP) signalling has been shown to play an essential role in multiple life cycle stages of the malarial parasite. It has been implicated in late liver stage development, red blood cell adhesion regulation, gameteogenesis, and cellular motility. The cGMP-dependent protein kinase (cPKG), the major effector of this signalling pathway, can be efficiently blocked with the small molecule Janus-motif-modified ATP-competitive inhibitor compound 2. Treatment of *P. falciparum* blood stage schizonts with compound 2 results in a complete block of cGMP activity, replicating PKG in the regulation of malarial growth. Recent work has shown this PKG inhibition blocks the maturation of PGSB1 from its precursors, perturbs its protein localization, and releases PGM1 from its sequestration (Collins et al., 2013). The specificity of the inhibitor has been confirmed by creating an antibody against mutant parasite line by substituting the same guano-nucleotide in the ATP binding pocket of PKG2 (Collins et al., 2013a). We used quantitative proteome proteomics combined with the PKG inhibitor compound 2 to identify PKG-dependent phosphorylation events in blood stage schizonts. Myosin A Serine 19 phosphorylation was specifically downregulated in the compound 2 treated whole parasite line, less so in the compound 2-treated PPG-TD192 mutant. An antibody specific to Myosin A phosphorylase 19 was used to validate this PKG-dependent phosphorylation event.

### Methods

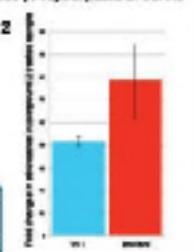
Tightly synchronized fully-segregated schizonts were treated with 2  $\mu$ M compound 2 (Fig. 1A) or DMSO for one hour (3 biological replicates). Parasite proteins were extracted, digested with trypsin, and labelled with biotin-UTP tags. The mix samples were then combined, enriched for phosphopeptides and analysed by liquid chromatography-tandem mass spectrometry (LCMS/MS) (Fig. 1B). The same experiment was performed with the inhibitor-resistant 32W PKG-null mutant line.



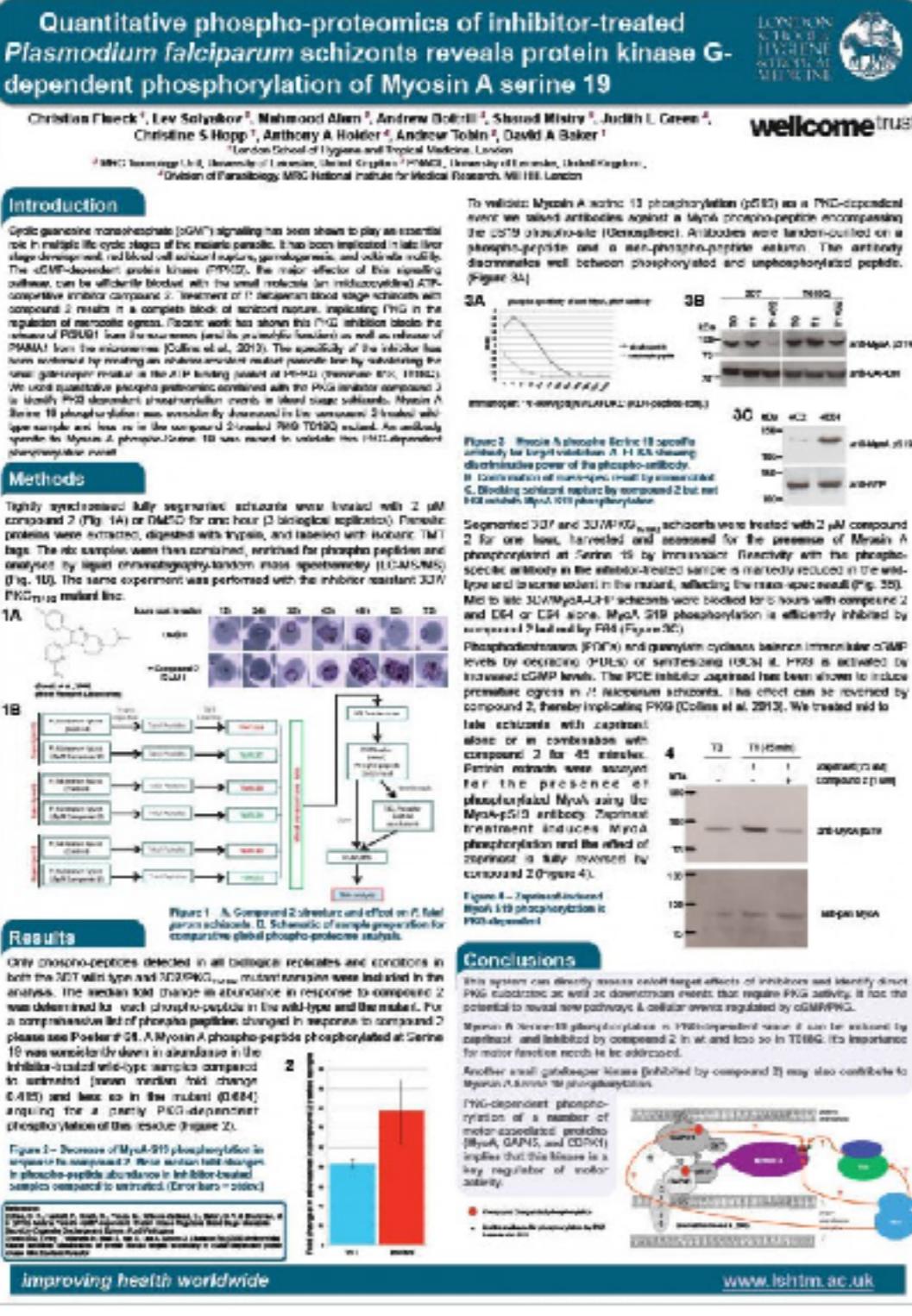
### Results

Only phosphopeptides detected in all biological replicates are included in both the 32T wild-type and 32W PKG-null mutant samples were included in the analysis. The median fold change in abundance in response to compound 2 was determined for each phosphopeptide in the wild-type and the mutant. For a comprehensive list of phosphopeptides changed in response to compound 2 please see (Supplement S1). Myosin A phosphopeptide phosphorylated at Serine 19 was significantly down in abundance in the inhibitor-treated wild-type samples compared to untreated (mean median fold change 0.418) and less so in the mutant (0.684) arguing for a partly PKG-dependent phosphorylation of this residue (Figure 2).

Figure 2. Decrease of Myosin A-S19 phosphorylation in response to compound 2. Mean median fold changes in phosphopeptide abundance in inhibitor-treated samples compared to untreated. (Error bars = stdev)



© 2013 The Authors. *Journal of Internal Medicine* © 2013 Royal Society of Medicine. *J Intern Med* 273: 363–372, 2013. DOI: 10.1111/j.1365-2796.2013.20342.x. Printed in the United Kingdom. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission of the copyright holders.



## Too densely packed

## Not inviting for the reader

We introduce MiningZinc, a general framework for constraint-based pattern mining, one of the most popular tasks in data mining. MiningZinc consists of two key components: a language component and a toolchain component.

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# Design

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Christian Fleck<sup>1</sup>, Lev Solyanikov<sup>2</sup>, Mahmood Alim<sup>3</sup>, Andrew Bolitho<sup>4</sup>, Shered Misra<sup>5</sup>, Judith L. Green<sup>4</sup>, Christine S. Hogg<sup>1</sup>, Anthony A. Holder<sup>4</sup>, Andrew Tobin<sup>5</sup>, David A. Baker<sup>1</sup>

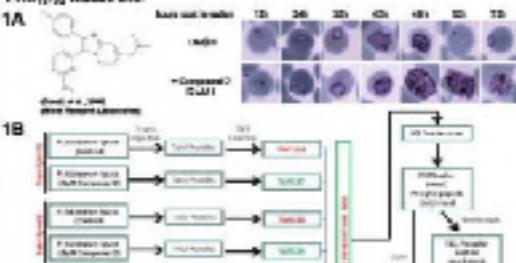
<sup>1</sup>London School of Hygiene & Tropical Medicine, London, United Kingdom; <sup>2</sup>MRC Toxicology Unit, University of Leicester, Leicester, United Kingdom; <sup>3</sup>University of Leicester, Leicester, United Kingdom; <sup>4</sup>Division of Parasitology, MRC National Institute for Medical Research, Mill Hill, London, United Kingdom; <sup>5</sup>Division of Immunology, MRC National Institute for Medical Research, Mill Hill, London, United Kingdom

### Introduction

Cyclic guanosine monophosphate (cGMP) signalling has been shown to play an essential role in multiple life cycle stages of the malarial parasite. It has been implicated in late liver stage development, red blood cell schizont rupture, gametogenesis, and ookinete motility. The cGMP-dependent protein kinase (PKG), the major effector of this signalling pathway, can be efficiently blocked by the small molecule (an imidazopyrimidine) ATP-competitive inhibitor compound 2. Treatment of *P. falciparum* blood stage schizonts with compound 2 results in a complete block of schizont motility, implicating PKG in the regulation of merozoite egression. Recent work has shown that PKG inhibition blocks the release of PGM81 from the merozoite, and its subsequent invasion, as well as release of PMAMA1 from the merozoite (Collins et al., 2013). The specificity of the inhibitor has been confirmed by treating an otherwise mutant resistant parasite line by substituting the same guano-nucleotide in the ATP binding pocket of PKG (Collins et al., 2013a). We used quantitative phospho-proteomics combined with the PKG inhibitor compound 2 to identify PKG-dependent phosphorylation events in blood stage schizonts. Myosin A Serine 19 phosphorylation was considerably decreased in the untreated 3D treated wild-type parasite and less so in the compound 2-treated P60-TD192 mutant. An antibody specific to Myosin A phosphorylated Serine 19 was used to validate the PKG-dependent phosphorylation event.

### Methods

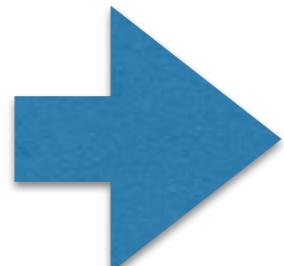
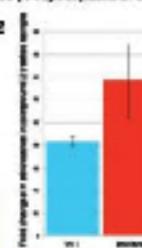
Tightly synchronised fully segmented schizonts were treated with 2  $\mu$ M compound 2 (Fig. 1A) or DMSO for one hour (3 biological replicates). Parasite proteins were extracted, digested with trypsin, and labelled with isotopic TMT tags. The six samples were then combined, enriched for phospho-peptides and analysed by liquid chromatography-tandem mass spectrometry (LC-MS/MS) (Fig. 1B). The same experiment was performed with the inhibitor-resistant 3D/PKG-mutant line.



### Results

Only phospho-peptides detected in all biological replicates and conditions in both the 3D wild-type and 3D/PKG-mutant parasite were included in the analysis. The median fold change in abundance in response to compound 2 was determined for each phospho-peptide in the wild-type and the mutant. For a comprehensive list of phospho-peptides changed in response to compound 2 please see (Supplementary Fig. 1). Myosin A phospho-peptide phosphorylated at Serine 19 was considerably down in abundance in the inhibitor-treated wild-type samples compared to untreated (mean median fold change 0.415) and less so in the mutant (0.684) arguing for a partly PKG-dependent phosphorylation of this residue (Figure 2).

Figure 2 – Decrease of Myosin A-S19 phosphorylation in response to compound 2. Mean median fold changes in phospho-peptide abundance in inhibitor-treated samples compared to untreated (Errorbars = std)



## Quantitative phospho-proteomics of inhibitor-treated *Plasmodium falciparum* schizonts reveals protein...

Christian Fleck<sup>1</sup>, Lev Solyanikov<sup>2</sup>, Mahmood Alim<sup>3</sup>, Andrew Bolitho<sup>4</sup>, Shered Misra<sup>5</sup>, Judith L. Green<sup>4</sup>, Christine S. Hogg<sup>1</sup>, Anthony A. Holder<sup>4</sup>, Andrew Tobin<sup>5</sup>, David A. Baker<sup>1</sup>

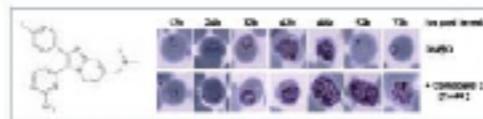
<sup>1</sup>London School of Hygiene & Tropical Medicine, London, United Kingdom; <sup>2</sup>MRC Toxicology Unit, University of Leicester, Leicester, United Kingdom; <sup>3</sup>University of Leicester, Leicester, United Kingdom; <sup>4</sup>Division of Parasitology, MRC National Institute for Medical Research, Mill Hill, London, United Kingdom; <sup>5</sup>Division of Immunology, MRC National Institute for Medical Research, Mill Hill, London, United Kingdom

### Introduction

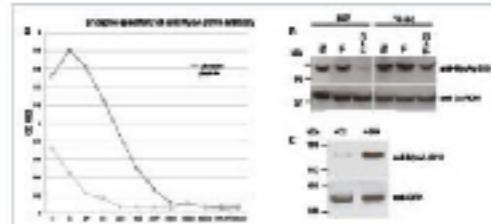
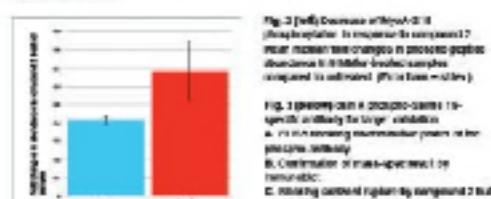
Cyclic guanosine monophosphate (cGMP) signalling has been shown to play an essential role in multiple life cycle stages of the malarial parasite. It has been implicated in late liver stage development, red blood cell schizont rupture, gametogenesis, and ookinete motility. The cGMP-dependent protein kinase (PKG), the major effector of this signalling pathway, can be efficiently blocked by the small molecule (an imidazopyrimidine) ATP-competitive inhibitor compound 2. Treatment of *P. falciparum* blood stage schizonts with compound 2 results in a complete block of schizont motility, implicating PKG in the regulation of merozoite egression. Recent work has shown that PKG inhibition blocks the release of PGM81 from the merozoite, and its subsequent invasion, as well as release of PMAMA1 from the merozoite (Collins et al., 2013). The specificity of the inhibitor has been confirmed by treating an otherwise mutant resistant parasite line by substituting the same guano-nucleotide in the ATP binding pocket of PKG (Collins et al., 2013a). We used quantitative phospho-proteomics combined with the PKG inhibitor compound 2 to identify PKG-dependent phosphorylation events in blood stage schizonts. Myosin A Serine 19 phosphorylation was considerably decreased in the untreated 3D treated wild-type parasite and less so in the compound 2-treated P60-TD192 mutant. An antibody specific to Myosin A phosphorylated Serine 19 was used to validate the PKG-dependent phosphorylation event.

### Methods

Tightly synchronised fully segmented schizonts were treated with 2  $\mu$ M compound 2 (Fig. 1A) or DMSO for one hour (3 biological replicates). Parasite proteins were extracted, digested with trypsin, and labelled with isotopic TMT tags. The six samples were then combined, enriched for phospho-peptides and analysed by liquid chromatography-tandem mass spectrometry (LC-MS/MS) (Fig. 1B). The same experiment was performed with the inhibitor-resistant 3D/PKG-mutant line.



### Results



To validate Myosin A serine 19 phosphorylation (pS19) as a PKG-dependent event we raised antibodies against a Myosin A phosphopeptide encompassing the pS19-phospho-site (Glycophosphopeptide). Antibodies were tandem-purified on a phospho-peptide and a non-phospho-peptide column. The antibody discriminates well between phosphorylated and unphosphorylated peptide (Figure 3A).

Segmented 3D and 3D/PKG-mutant schizonts were treated with 2  $\mu$ M compound 2 for one hour, harvested and assessed for the presence of Myosin A phosphorylated at Serine 19 by immunocolor. Reactivity with the phospho-specific antibody in the inhibitor-treated sample is markedly reduced in the wild-type and increases again in the mutant, reflecting the mass-spectrum result (Fig. 3B). Wild-type 3D/Myosin A-S19<sup>-/-</sup> schizonts were treated for 6 hours with compound 2 and DMSO alone. Myosin A-S19 phosphorylation is efficiently inhibited by compound 2 (Figure 3C).

Phosphodiesterase (PDE) and guanylyl cyclase balance immature cGMP levels by decreasing cGMP or synthesising cGMP. It is activated by increased cGMP levels. The PDE inhibitor zaprinast has been shown to induce premature egress in *P. falciparum* schizonts. This effect can be reversed by compound 2, thereby implicating PKG (Collins et al., 2013). We treated wild-type schizonts with zaprinast alone or in combination with compound 2 for 45 minutes. Protein extracts were assayed for the presence of the phosphorylated Myosin A-S19 by Myosin A-S19 antibody. Zaprinast treatment induces Myosin A phosphorylation and the effect of zaprinast is fully reversed by compound 2 (Figure 4).



This system can directly assess off-target effects of inhibitors and identify direct PKG substrates as well as downstream events that require PKG activity. It has the potential to reveal new pathways & cellular events regulated by cGMP/PKG.

- Myosin A Serine 19 phosphorylation is PKG-dependent since it can be induced by zaprinast and inhibited by compound 2 in *vitro* and less so in TB1Q0. Its importance for motor function needs to be addressed.
- Another small gatekeeper kinase (inhibited by compound 2) may also contribute to Myosin A Serine 19 phosphorylation.
- PKG-dependent phosphorylation of a number of motor-associated proteins (MyoA, GAP15, and CCFK1) implies that this kinase is a key regulator of motor activity.

### Conclusions

Only phospho-peptides detected in all biological replicates and conditions in both the 3D wild-type and 3D/PKG-mutant parasite were included in the analysis. The median fold change in abundance in response to compound 2 was determined for each phospho-peptide in the wild-type and the mutant. For a comprehensive list of phospho-peptides changed in response to compound 2 please see (Supplementary Fig. 1). Myosin A phospho-peptide phosphorylated at Serine 19 was considerably down in abundance in the inhibitor-treated wild-type samples compared to untreated (mean median fold change 0.415) and less so in the mutant (0.684) arguing for a partly PKG-dependent phosphorylation of this residue.

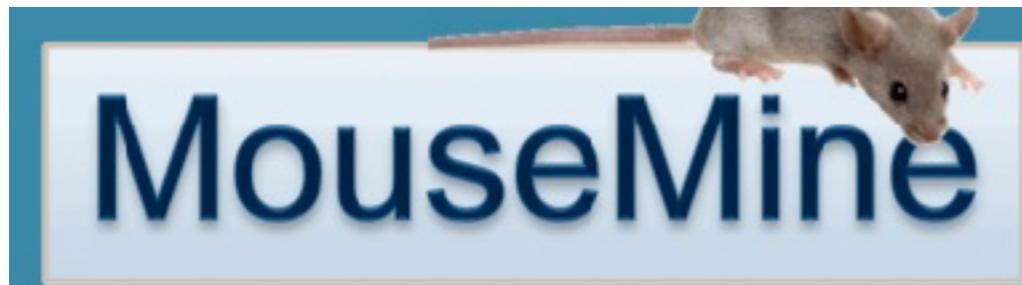
### Results

### References

Fleck C, Solyanikov L, Alim M, Bolitho A, Misra S, Green JL, Hogg CS, Holder AA, Tobin A, Baker DA (2013) Quantitative phospho-proteomics of inhibitor-treated *Plasmodium falciparum* schizonts reveals protein kinase G-dependent phosphorylation of Myosin A serine 19. *J Proteome Res* 12: 10840–10849.

# Design

Don't use full sentences and paragraphs



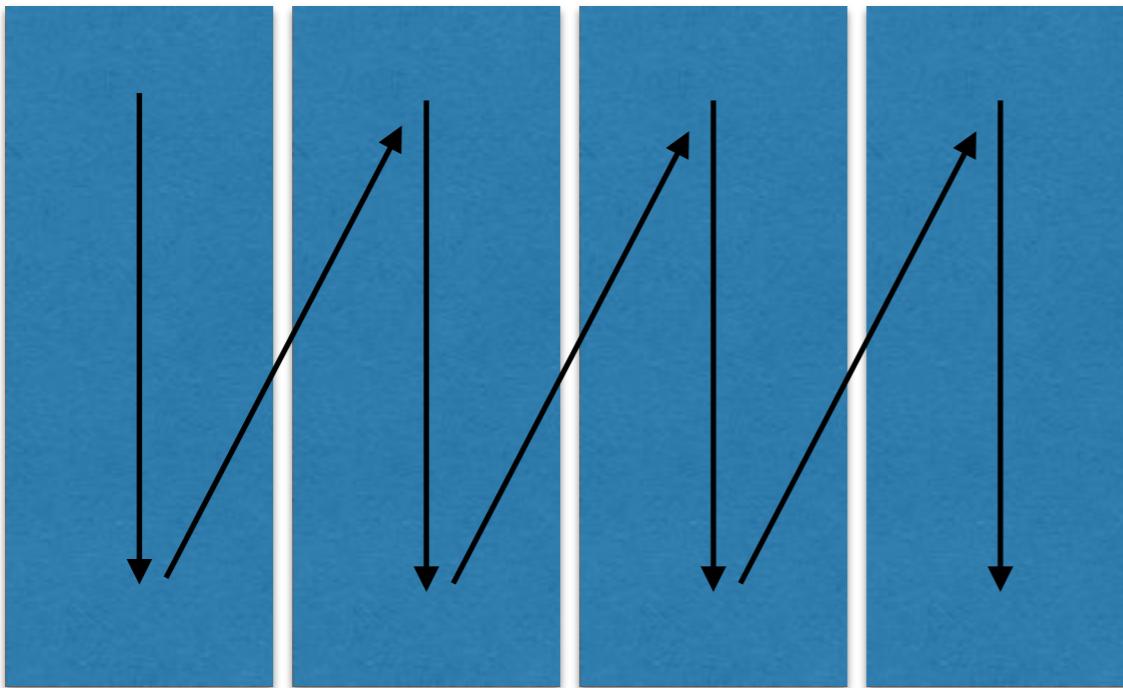
**MouseMine**

**Mining MGI Data**  
Joel Richardson, Howie

The Mouse Genome Informatics (MGI) project at The Jackson Laboratory collects, integrates, and disseminates information about the laboratory mouse (<http://www.informatics.jax.org>). MouseMine is a powerful new tool for accessing MGI data (<http://www.mousemine.org>). Built on the InterMine data warehouse framework (<http://www.intermine.org>), MouseMine provides: (1) access to the core data and annotations from MGI (gene and allele catalog, gene expression data, strains and models, function, phenotype, and disease annotations, cross references); (2) numerous canned queries (templates); (3) the ability to modify and refine any query dynamically or to compose a new query from scratch, using a point-and-click interface; (4) the ability to download any query result in a variety of formats or to forward the results to Galaxy or GenomeSpace; (5) the ability to create and save lists of objects by uploading ids or by saving objects returned by queries; (6) the ability to combine lists (intersection, union, difference) and then use those lists to drive further queries to hone their results; (7) support for both anonymous and authenticated usage (logged in users can save lists and customized queries permanently); and finally, (8) the ability to access all the aforementioned functionality via RESTful web services. This poster illustrates one example of how MouseMine enables powerful querying via a sequence of simple steps.

Use bullet lists

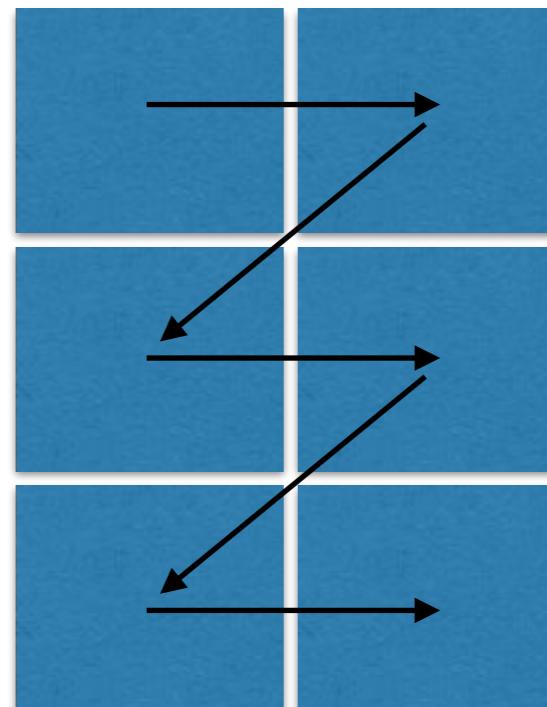
# Design



## columns

(works well with landscape)

**boxes**  
(works well with portrait)  
make sure the flow is clear





# Mining MGI Data Using MouseMine

Joel Richardson, Howie Motenko, Steven Neuhauser, Michael O'Keefe

The Jackson Laboratory, Bar Harbor, Maine 04609

The Mouse Genome Informatics (MGI) project is: The Jackson Laboratory collects, integrates, and disseminates information about the laboratory mouse (<http://www.informatics.jax.org>). MouseMine is a powerful new tool for accessing MGI data (<http://www.mousemine.org>). Built on the InterMine data warehouse framework (<http://www.intermine.org>), MouseMine provides: (1) access to the core data and annotations from MGI (gene and allele catalog, gene expression data, strains and modes, function, phenotype, and disease annotations, cross references); (2) numerous canned queries (templates); (3) the ability to modify and refine any query dynamically or to compose a new query from scratch, using a point-and-click interface; (4) the ability to download any query result in a variety of formats or to forward the results to Galaxy or GenomeSpace; (5) the ability to create and save lists of objects by uploading IDs or by saving objects returned by queries; (6) the ability to combine lists (intersection, union, difference) and then use those lists to drive further queries to hone their results; (7) support for both anonymous and authenticated usage (logged-in users can save lists and customize queries permanently); and finally, (8) the ability to access all the aforementioned functionality via RESTful web services. This poster illustrates one example of how MouseMine enables powerful querying via a sequence of simple steps.

**Start here:** [www.mousemine.org](http://www.mousemine.org)

**Example: download GO annotations for genes associated with the pulmonary fibrosis phenotype.**

**1. Define:**  
1. Find the template that maps phenotypes to genes.  
2. Type in "pulmonary fibrosis" and execute.  
3. From the results, save the list of associated genes.  
4. Find the template that maps genes to functions (GO terms).  
5. Plug in the saved list and execute.  
6. From the results, download as tab-delimited text.

**2. Run template:**  
Template are grouped by area on the home page. Find template that maps phenotypes to genes.

**3. Save a list:**  
Result shows mice transcribed associated to pulmonary fibrosis. From here you can page, sort, filter add or remove columns, forward genes, and many other options. For this example we want to save the list of genes, so we can drive the next query.

**4. Pick next template:**  
We now have a list of results genes associated with pulmonary fibrosis. Go to template manager and find "GO Annotations". Now we want to pick this template.

**5. Pick next template:**  
Now we have a list of results genes associated with pulmonary fibrosis. Go to template manager and find "GO Annotations". Now we want to pick this template.

**6. Download results:**  
Format: Tab-delimited text. Click "Download" and "Next step".

**Detailed view of a query result table:**  
Detailed view of a query result table. Again, we can sort, filter, etc. We just want to download it. The downloadable options include tab-delimited format, allow column rearrangement, etc. In this case, the default is fine, so we click "Finish download".

**7. Circular:**

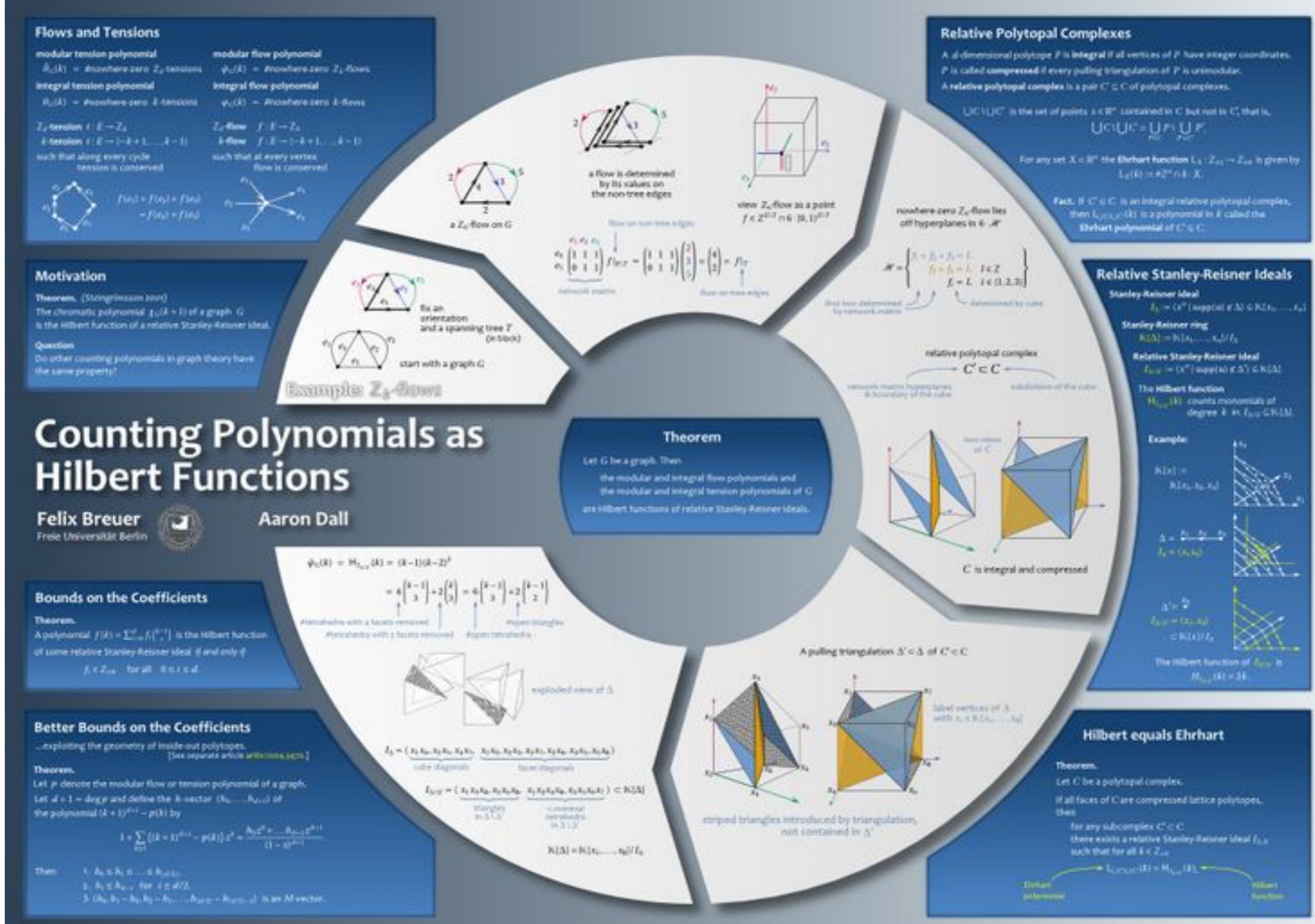
**MouseMine is a member of the InterMine consortium, which comprises intermine instances for the supermodel organisms:**

- FlyMine
- MouseMine
- RatMine
- WormMine
- YeastMine
- ZebrafishMine

**MouseMine and mgi are supported by grants from NIH:**

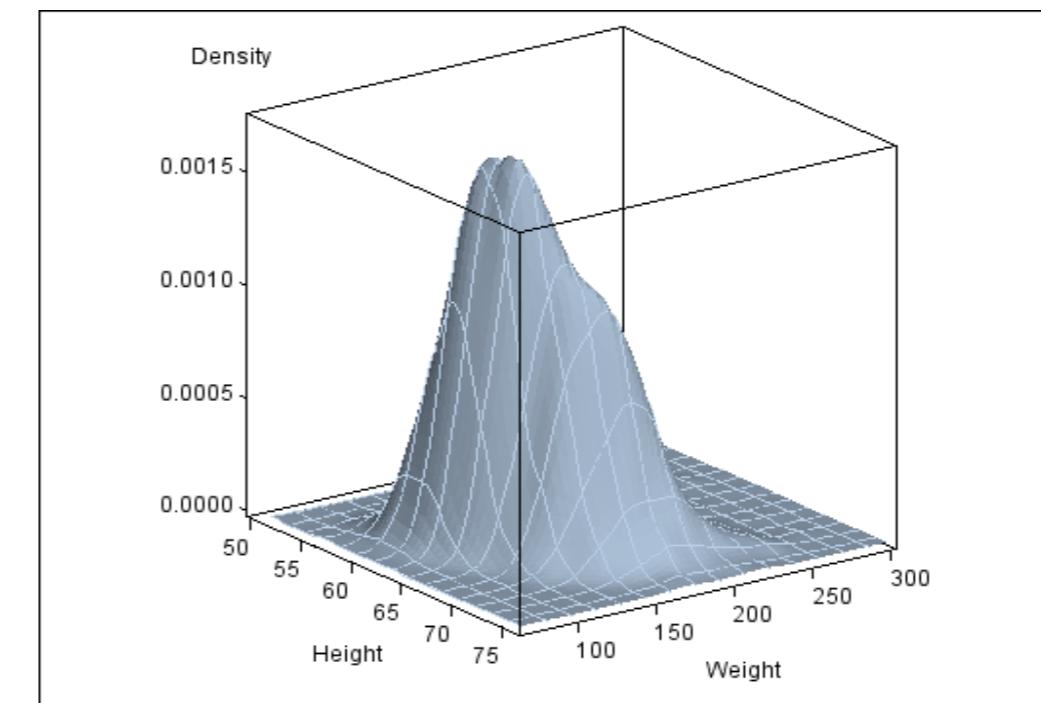
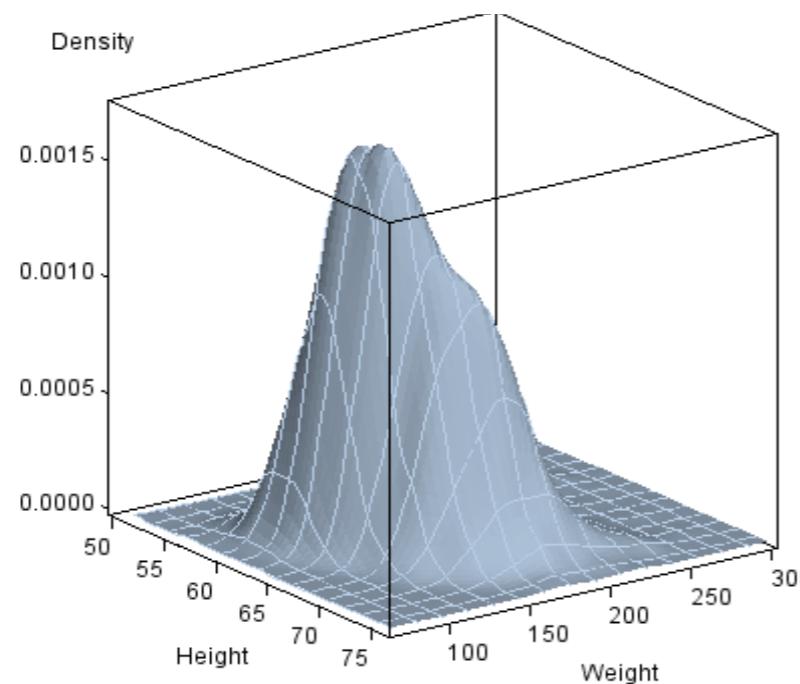
- MGI
- JAX The Jackson Laboratory
- NICHD

circular



# Design

Use boxes and lines



# Design

Use colors and font size to mark important parts

But *don't* **OVERUSE** it

**Use a soft and clear color scheme**

You can add non-relevant contextual visual elements,  
but don't let them distract the reader

(e.g. picture of a robot for robotics, a doctor for medical applications,  
a sports person for sports analytics, ...)

Align your boxes!

# EPR Spectroscopy for the Forensic Analysis of Glass

Anna K. Weaver

Dr. N. Dennis Chasteen, Faculty Advisor

Department of Chemistry, University of New Hampshire, Durham NH



## ABSTRACT

Increasingly sensitive instrumentation and new, creative, forensic analysts utilize trace evidence more efficiently and effectively than ever before. Investigators quickly identify and/or compare samples are becoming more and more valuable, especially if the cost of the analysis can be kept to a minimum.

It is not unusual to find broken glass at the scene of a crime and this trace evidence can be very useful for connecting an individual to the offense. Currently, the most successful means of analyzing glass fragments involves evaluating the chemical composition of the sample. This requires large, expensive instruments, like an inductively couple plasma mass spectrometer (ICP-MS), as well as intensive and destructive sample preparation unless laser ablation is applied.

The research completed here has shown that electron paramagnetic resonance (EPR) spectroscopy can be used to compare glass shards to determine whether or not they came from the same source. By reducing the range of the required magnetic field, a smaller, more cost-effective instrument can be developed. This means of analysis is fast, requires little to no sample preparation, and is non-destructive.

## GLASS AS FORENSIC EVIDENCE

- Glass can be used as valuable associative evidence by linking an object or person to a crime. Because of their inelastic and transparent nature, glass fragments often leave the crime scene on the clothes, skin and hair of even the most careful criminal.
- In the past, glass was analyzed using primarily physical characteristics, including color, density and refractive index. A decrease in the number of glass producers, combined with an increase in quality control standards, has led to a drastic reduction in refractive index variability.
- Analysts are now being forced to discriminate between glass samples using their chemical composition. Many of the molecular level methods take advantage of trace metals that are found within the matrix of glass. These can be introduced intentionally as modifiers or to add color to the glass. In addition, a number of metal ions are often present as impurities in the supplies (e.g. sand) used to produce the glass. The trace metal compositions of such starting materials are unique to their source.
- The FBI has had success using inductively couple plasma analysis to compare the trace metal composition of automobile side windows<sup>1</sup>, but such instruments are very expensive and require specialized training of the operator.

## ELECTRON PARAMAGNETIC RESONANCE SPECTROSCOPY

- Electron paramagnetic resonance (EPR) spectroscopy detects the presence and arrangement of unpaired electrons, like those carried by many of the metal ions found in glass. By submitting a sample to microwave frequency radiation and a variable magnetic FIELD, it is possible to determine the particular field strength at which resonance occurs for each kind of unpaired electron present.
- The spectrum produced during the EPR analysis of a glass sample is affected by the kinds of metal ions present, their environment and symmetrical orientation, and their concentration. Because of the number of factors affecting the spectrum for each sample of glass and the enormous variation, on the chemical level, between samples, an EPR spectrum has the potential to act like a "fingerprint" for a single glass source.
- EPR is capable of analyzing solid samples with very little preparation time and it does not destroy the fragment, so that the evidence has not been lost and further testing is possible if necessary or desired.
- Affordable, tabletop EPR spectrometers can be designed for a specific purpose and are already in use in a number of industries.

# Don't use gradient behind text

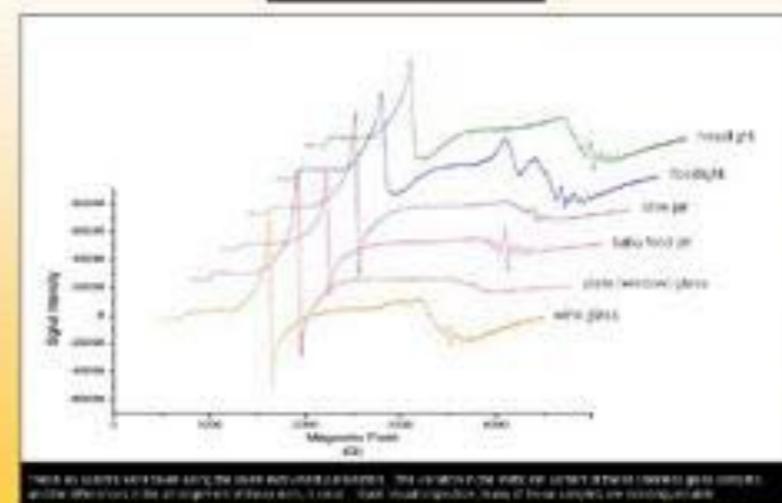
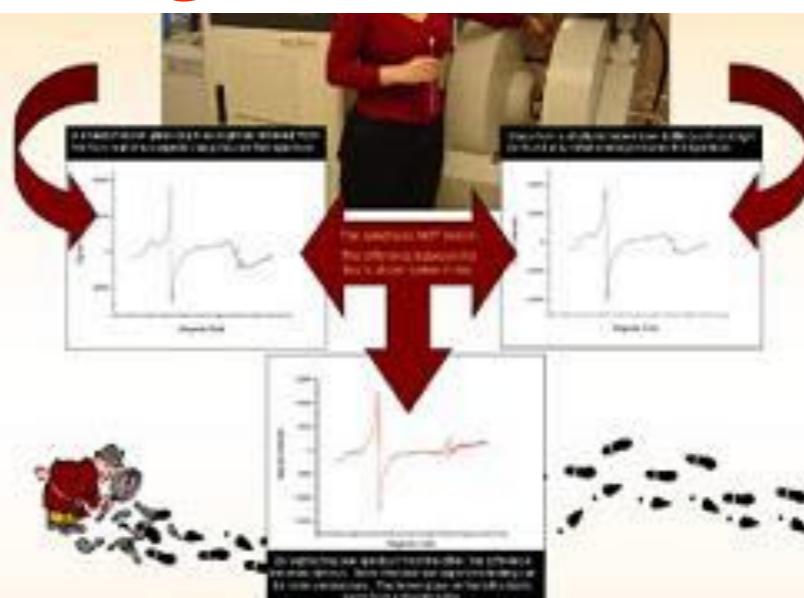


Figure 1: ESR spectra of various glass samples. The curves are taken from the spectra of three fractured glass samples. The glass differences in the absorption intensity is clear. Each signal contains many of broad signals are incongruous.

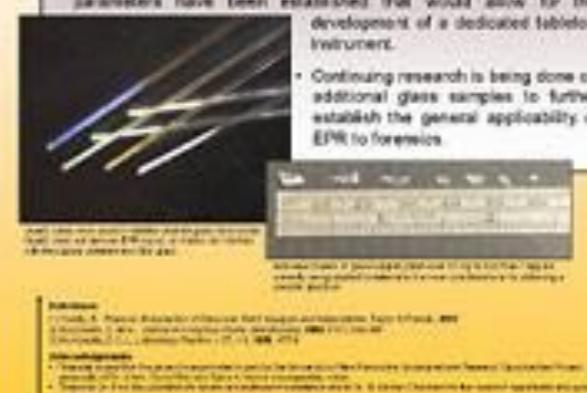
- Over 1000 sources were collected, washed in soap & water and air dried. The samples were then ground and shattered with a hammer.
- The analyses were performed using the new Bruker E500 EPR spectrometer pictured here.

## RESULTS

- A wide variety of glass samples were tested at different instrument settings. It was found that EPR spectra can be obtained at maximum power and modulation amplitude without spectral distortion. However, a lower power of 13.55 mW is the best compromise between sensitivity and instrument stability.
- Although EPR analyses often benefit from measurement at liquid nitrogen temperature (77 K), it has been found that the signals in glass samples are sufficiently strong at room temperature.
- EPR spectra measured between 500 G and 4500 G have been proven sufficient for discriminating between glass samples. Literature and research reported here have identified characteristic resonances for iron(III), manganese(II), vanadium(V) and copper(II), four of the metals prevalent in glass samples.

## CONCLUSIONS

- Research conducted in the 70's suggested that with increased sensitivity, EPR could be used to discriminate between glass samples.<sup>2</sup> The research here has proven that current instrumentation provides the necessary sensitivity to apply this method for forensic purposes and that visually identical glass samples can be readily distinguished by EPR.
- In addition, the magnetic field requirements and instrument parameters have been established that would allow for the development of a dedicated tabletop instrument.
- Continuing research is being done on additional glass samples to further establish the general applicability of EPR to forensics.



Instrument: Bruker E500 ESR spectrometer that requires no vacuum, fast 100 kHz, 13.55 mW power, 1000 G modulation, 1000 G resolution.

Photograph: A photograph of a shattered glass sample. The glass pieces are sharp and jagged, indicating it was shattered with a hammer.



# PIGS IN SPACE: EFFECT OF ZERO GRAVITY AND AD LIBITUM FEEDING ON WEIGHT GAIN IN CAVIA PORCELLUS



SPACE-EXES

## ABSTRACT:

One ignored benefit of space travel is a potential elimination of obesity, a chronic problem for a growing majority in many parts of the world. In theory, when an individual is in a condition of zero gravity, weight is eliminated. Indeed, in space one could conceivably follow ad libitum feeding and never even gain an gram, and the only side effect would be the need to upgrade one's stretchy pants ("exercise pants"). But because many diet schemes start as very good theories only to be found to be rather harmful, we tested our predictions with a long-term experiment. In a colony of Guinea pigs (*Cavia porcellus*) maintained on the International Space Station, individuals were housed separately and given unlimited amounts of high-calorie food pellets. Fresh fruits and vegetables were not available in space so were not offered. Every 30 days, each Guinea pig was weighed. After 5 years, we found that individuals, on average, weighed nothing. In addition to weighing nothing, no weight appeared to be gained over the duration of the protocol. If space continues to be gravity-free, and we believe that assumption is sound, we believe that sending the overweight — and those at risk for overweight — to space would be a lasting cure.

## INTRODUCTION:

The current obesity epidemic started in the early 1980s with the invention and proliferation of elastane and related stretchy fibers, which released wearers from the rigid constraints of clothes and permitted monthly weight gain without the need to buy new outfit. Indeed, exercise today for hundreds of million people involve only the act of wearing stretchy pants in public, presumably because the compressive pressure forces fat molecules to adopt a more compact tertiary structure (Xavier 1985).

Luckily, at the same time that fabrics became stretchy, the race to the moon between the United States and Russia yielded a useful fact: gravity in outer space is minimal to nonexistent. When gravity is zero, objects cease to have weight. Indeed, early astronauts and cosmonauts had to secure themselves to their radios with seat belts and sticky boots. The potential application to weight loss was noted immediately, but at the time travel to space was prohibitively expensive and thus the issue was not seriously pursued. Now, however, multiple companies are developing cheap extra-orbital travel options for normal consumers, and potential travelers are also creating new ways to pay for products and services that they cannot actually afford. Together, these factors open the possibility that moving to space could cure overweight syndrome quickly and permanently for a large number of humans.

We studied this potential by following weight gain in Guinea pigs, known on Earth as fond of ad libitum feeding. Guinea pigs were long envisioned to be the "Guinea pigs" of space research, too, so they seemed like the obvious choice. Studies on humans are of course desirable, but we feel this current study will be critical in acquiring the attention of granting agencies.



## CONCLUSIONS:

Our view that weight and weight gain would be zero in space was confirmed. Although we have not replicated this experiment on larger animals or primates, we are confident that our result would be mirrored in other model organisms. We are currently in the process of obtaining necessary human trial permissions, and should have our planned experiment initiated within 80 years, pending expedited review by local and Federal IRBs.

## ACKNOWLEDGEMENTS:

I am grateful for generous support from the National Research Foundation, Black Hole Diet Plans, and the High Fructose Sugar Association. Transport flights were funded by SPACE-EXES, the consortium of wives divorced from insanely wealthy space-flight startups. I am also grateful for comments on early drafts by Mañana Athletic Club, Corpus Christi, USA. Finally, sincere thanks to the Cuy Foundation for generously donating animal care after the conclusion of the study.

## LITERATURE CITED:

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- Sekulić, S. B., D. D. Luković, and N. M. Naumović. 2005. The Fetus Cannot Exercise Like An Astronaut: Gravity Loading Is Necessary For The Physiological Development During Second Half Of Pregnancy. Medical Hypotheses. 64:221-228.
- Xavier, M. 1985. Elastane Purchases Accelerate Weight Gain In Case-control Study. Journal of Obesity. 2:30-40.

# Examples

# Solving Probability Problems in Natural Language

Anton Dries<sup>1</sup>, Angelika Kimmig<sup>1</sup>, Jesse Davis<sup>1</sup>, Vaishak Belle<sup>2</sup> and Luc De Raedt<sup>1</sup>

<sup>1</sup> Department of Computer Science, KU Leuven, <sup>2</sup> University of Edinburgh  
anton.dries@cs.kuleuven.be

**Goal** We develop a fully automated approach for answering probability word problems formulated in natural language.

**Challenges:** (1) Understand the question, (2) Obtain the necessary background, (3) Solve the question.

**Two-step approach:** natural language  $\Rightarrow$  formal model  $\Rightarrow$  solution

**Formal model**

A probability word problem can be formalized using:

- constraints on multisets  
e.g. number of objects with a given property
- actions on multisets  
e.g. take a random element from a set with replacement
- observations and questions about the truth value of constraints  
e.g. all elements have property X

**Example:**

- mathematical notation:

```
multiset bag      first = take(bag)
#white(bag) = 4    #first = 1
#blue(bag) = 8     rest(snd) = rest(first) \ snd
#red(bag) = 6      #snd = 1
observe #red(first) = #first
probability #white(snd) = #snd
```
- Prolog notation:

```
group(bag).
given(exactly(4, bag, white)).
given(exactly(8, bag, blue)).
given(exactly(6, bag, red)).
```

```
take(bag, marble1, 1).
observe(all(marble1, red)).
take(rest(marble1), marble2, 1).
probability(all(marble2, white)).
```

**Natural Language  $\Rightarrow$  Model**

Using off-the-shelf NLP tools (NLTK, WordNet, Stanford CoreNLP), hand-crafted rules and a simple classifier.

- Find numbers based on POS tags and word matching
- Classify numbers based on surrounding structure in the parse tree (whether number is setup, action, constraint or irrelevant)
- Extract the parents and properties
- Find questions and property values and post-process the model

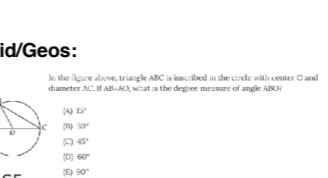
(In this part of the work we focused on a subset of problems)

**Model  $\Rightarrow$  Solution**

Intelligent solver written in **ProbLog**

**Related Work**

**Aristo:** 

**Euclid/Geos:** 

**Conclusions & Future Work**

We developed a two-step approach for automatic solving of probability word problems. Our contributions are the following:

1. A **formal model** to represent such questions
2. **Solver** to compute the solution of such a formal model
3. NLP component to **extract a formal model from text**
4. **Dataset** of 2376 labeled questions

Our future work will focus mainly on improving the NLP component.

More information (including online version):

[https://dtai.cs.kuleuven.be/problog/natural\\_language](https://dtai.cs.kuleuven.be/problog/natural_language)

KU LEUVEN

DTAI  
DATA  
ARTIFICIAL  
INTELLIGENCE

# Practical

# Tools

- Use a graphical tool:
  - Word/Powerpoint/Publisher (Windows / Mac)
  - Pages/Keynote (Mac)
  - OpenOffice Impress/Writer (Windows / Mac / Linux)
- Also possible with LaTeX (but harder to control details of layout)

# Paper size

A0 portrait

84.1 x 118.9cm

*A0 landscape*

*(not always supported)*

A1 portrait

half of A0

A1 landscape

***When in doubt: ask the organizer***

*Always set your editor to the actual paper size*

# Font sizes

Font sizes range from 84 (title) to 16 (footnotes)

**Tip:** print out a page with different font sizes

*Always set your editor to the actual paper size*

This is 84 pt

This is 80 pt

This is 72 pt

This is 60 pt

This is 48 pt

This is 42 pt

This is 36 pt

This is 28 pt

This is 24 pt

This is 18 pt

This is 16 pt

This is 12 pt

This is 10 pt

# Printing

- KU Leuven ICTS offers a printing service  
<https://admin.kuleuven.be/icts/services/plotter>
- For this course: printing is organized by us

# Presenting

# Poster session



(source: collingpurrington.com)

copyright Downside Norge - Clifford

# Presenting a poster

- Prepare a *short* explanation of your poster
- Create a dialog
  - Ask the person what they do, adapt your story
  - Speak to the person, not your poster

# References

- **Read this one!**  
<http://colinpurrington.com/tips/poster-design>
- Google: “scientific poster design”

# Bad poster bingo

Different parts of poster don't line up	Boxes within boxes	order reading Zigzag	More than three <b>typefaces</b>	Long-winded title
Gradient fills in coloured boxes	Big blocks of text	Photographic background	Unlabelled error bars on graphs	Pixelated pictures
<b>More than five colours</b>	Institutional logos bookending title	Free space	ALL CAPITALS	Text with shadows, <b>outlines</b> , or bevels
Abstract	<u>Underlined</u> text	Comic Sans	3-D graphs	Checking tablet or phone during presentation
Tables showing data that could be in a graph	Poster does not fit on poster board	Comic Sans (it's that annoying)	Objects almost touching or overlapping	Tiny, unreadable type

By Zen Faulkes, [betterposters.blogspot.com](http://betterposters.blogspot.com)

Inspired by: <http://www.monicametzler.com/bad-presentation-bingo/>