Establishing a new foundation in support of translational informatics

When the tranSMART platform was open-sourced by Johnson & Johnson it needed a strong community to help support it and make it into a reliable, sustainable global solution for adoption across institutions engaged in translational biomedical research. The Pistoia Alliance helped the early adopters to establish the tranSMART Foundation that provides the infrastructure and services required to give the platform the best chance of success. The Foundation now has over 20 members and is growing rapidly.

"The support of the Pistoia Alliance was invaluable in helping get the tranSMART Foundation set up quickly and correctly. It enabled us to focus on getting on with the main job of making the tranSMART platform truly sustainable."

Keith O. Elliston, CEO, tranSMART Foundation
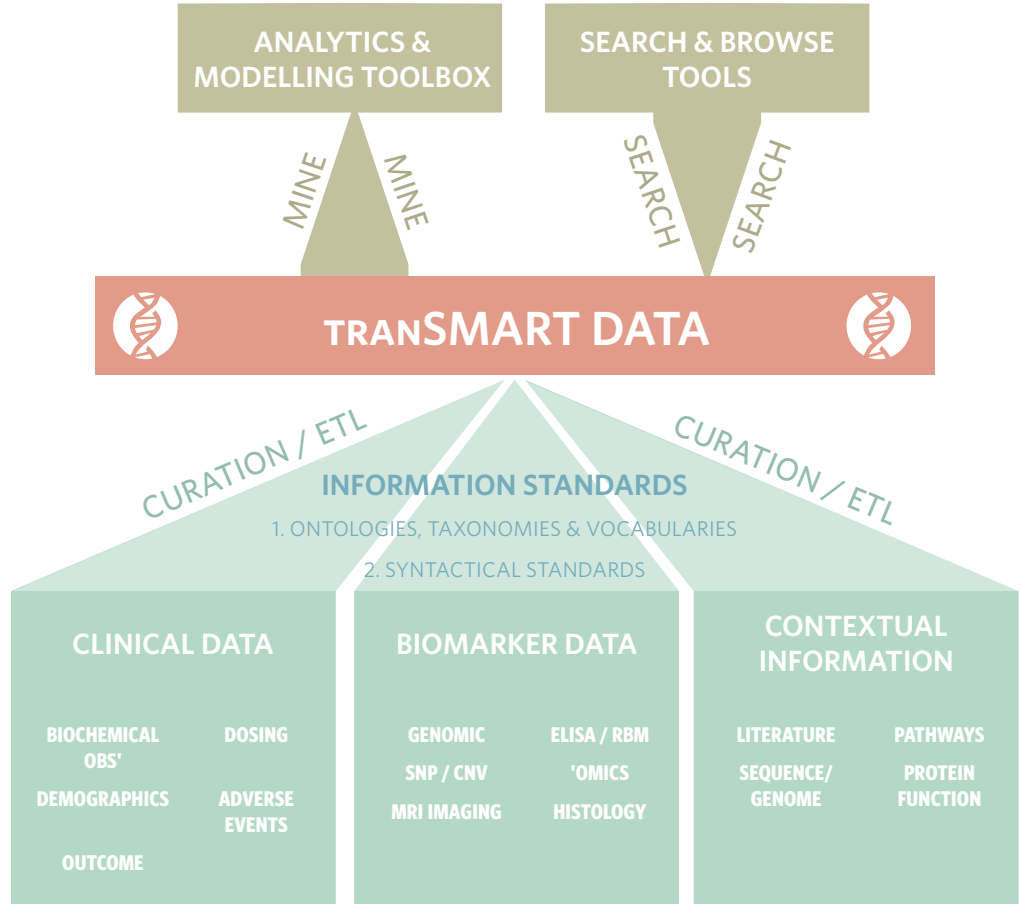
Exploring hypotheses

The tranSMART platform is a repository for all types of information from genomic data, sequence information, pathways, and transcription factors, through to clinical visits, clinical trials, and clinical studies. The platform provides scientists working on multiple aspects of all kinds of diseases and conditions with an easy to use interface that can gather together and query a large repository of data subsets of interest.

Scientists can explore hypotheses, create subsets, determine cohorts, and use the outcomes to gain insights into disease and guide them as to what to do next in their experimentation. Scripting tools and application programming interfaces (APIs) allow access to advanced analytics, scripted statistics, connections to external tools such as R and Spotfire, and even a link to IBM Watson as demonstrated at the 2015 Bio-IT World Conference & Expo.

Before tranSMART there were not any systems available that covered the same breadth of data, due to the complexities of connecting together so many different data types and aspects of metadata. The ability to gather all of these together is what makes the platform unique.

tranSMART process
How it works

tranSMART
v1.2

ANALYTICS & MODELLING TOOLBOX

SEARCH & BROWSE TOOLS

MINE MINE

SEARCH SEARCH

tranSMART DATA

CURATION / ETL   CURATION / ETL

INFORMATION STANDARDS
1. ONTOLOGIES, TAXONOMIES & VOCABULARIES
2. SYNTACTICAL STANDARDS

CLINICAL DATA

BIOCHEMICAL OBS'   DOSING

DEMOGRAPHICS   ADVERSE EVENTS

OUTCOME

BIOMARKER DATA

GENOMIC   ELISA / RBM

SNP / CNV   'OMICS

MRI IMAGING   HISTOLOGY

CONTEXTUAL INFORMATION

LITERATURE   PATHWAYS

SEQUENCE/   PROTEIN
GENOME   FUNCTION

"Over the last two years, virtually out of nowhere, the tranSMART Foundation has established a substantial user base for the platform and is in a strong financial position to continue its program of outreach and development. Well over 75% of the attendees at our free training sessions are new to tranSMART which demonstrates that there is still massive potential to grow."

Rudy Potenzone,
VP Marketing,
tranSMART Foundation

Project history

Work first started on tranSMART in 2008 as an internal project at Johnson & Johnson (J&J), but they soon realized that such a complex solution was difficult to sustain for a single company. Through conversations held at various conferences where work on tranSMART was presented they came to learn that many others shared their need for such a solution. This led to a decision to open-source the project in 2012, depositing the source code into GitHub, with the idea of nurturing a community of collaboration to develop around it.

As is often the case with open-source projects, the simple existence of the code in the public domain does not automatically create a community to support it. Active efforts have to be made to recruit volunteers, establish a project

management structure, and work on spreading the word and encouraging adoption of the software as widely as possible in order to make it self-sustaining.

When J&J first published the code in 2012, the Pistoia Alliance and the University of Michigan quickly realized that establishing this formal structure would be vital to ensure the project survived and the newly released codebase would not diverge. At a meeting on the sidelines of the 2012 Bio-IT World Conference & Expo with some of tranSMART's earliest adopters, including Imperial College London, they decided to create the tranSMART Foundation, with the Pistoia Alliance and the University of Michigan as the two founding members.

A helping hand

Throughout the development of tranSMART, J&J was very public about the project and the fact that it was available. It had a clear focus on translational medicine, was obviously pre-competitive, and there was a need for the whole community to be involved with the direction and evolution of the capability if it were to remain relevant. This made it easy for the supporters of the project to identify its value and commit to creating the tranSMART Foundation.

However, without a legal entity to commit funds to, it was not possible for the key backers to offer financial support. The creation of a suitable legal entity within a reasonable length of time was not something that could easily be achieved given the limited resources available.

A workaround was required and the Pistoia Alliance was able to help.

The Pistoia Alliance set up a project workstream dedicated to the creation of a fully independent tranSMART Foundation. The financial support earmarked for use by the Foundation was provided to this Pistoia Alliance workstream instead, and the Alliance used it to cover the costs of creating the legal non-profit entity, obtaining professional counsel on setting up its bylaws and other documentation required for compliance, and developing its accounting procedures. Once this was done, the Pistoia Alliance transferred the remaining money to the now fully established and independent tranSMART Foundation that is now able to go out and directly raise funds of its own.

Figure 1: This is an example of a genome-wide association study (GWAS) showing an interactive Manhattan Plot using the Genome-Wide Association Visual Analyzer (GWAVA). These tools are used to find relationships between genetic variants in different individuals and a trait of interest.
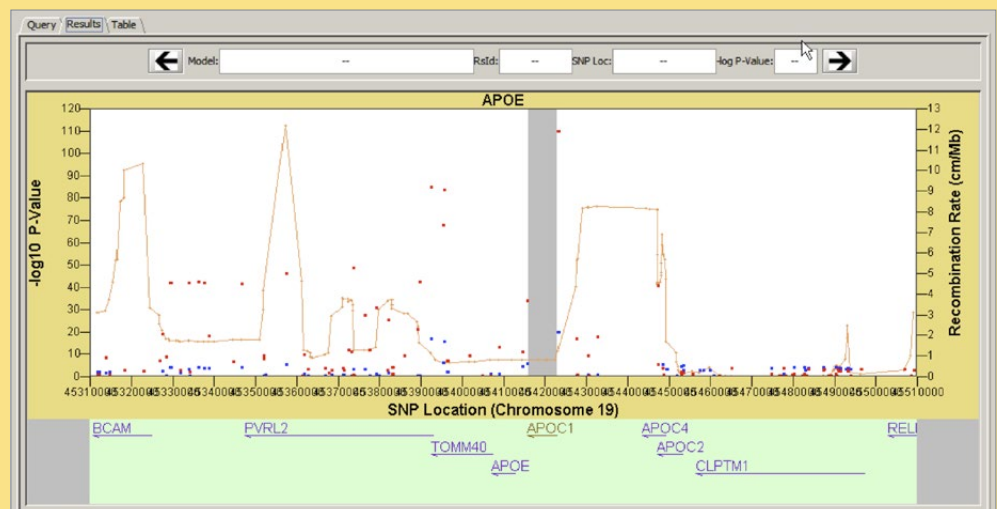

Figure 2: The tranSMART Platform includes a number of connections to popular tools used in translational research. This example shows information transferred from tranSMART to the Dalliance Genome Browser for further visualization and analysis.

Awards at 2015 Bio-IT World Conference & Expo

- Best in Show Award (Informatics Tools & Data) for tranSMART
- Judge's Prize for the Michael J. Fox Foundation for its work on tranSMART with Thomson Reuters
- Best Poster for The Hyve's "Multi-omics data analysis in tranSMART using the Cell Line User Case dataset"

Award-winning platform

Several companies now offer commercial services around tranSMART, although the tranSMART Foundation does not benefit financially from this type of activity. Instead, membership fees from more than 20 organisations including a mixture of software vendors and pharmaceutical companies fund the Foundation.

This independent funding enables the Foundation to offer the bulk of its activities for free, with conferences, training sessions, and user manuals all made publicly available at no cost. The tranSMART platform source code also continues to be fully open source. A demonstration installation of the platform has been provided by BT and is available for public access at no cost, and multiple datasets have been contributed for the benefit of the research community via the tranSMART community forums.

The future can never be predicted or guaranteed, but at present it is looking stable for the tranSMART Foundation

with an active membership program campaign under way to add to the existing 20+ members. Three awards at the 2015 Bio-IT World Conference & Expo for tranSMART and its end-users – the Best in Show Award (Informatics Tools & Data) for tranSMART itself, a special Judge's Prize for the Michael J. Fox Foundation for its work on tranSMART with Thomson Reuters, and Best Poster for The Hyve's *Multi-omics data analysis in tranSMART using the Cell Line User Case dataset* – have clearly illustrated the impact and importance of the project.

More information

info@pistoiaalliance.org
http://www.pistoiaalliance.org/projects/transmart-foundation/
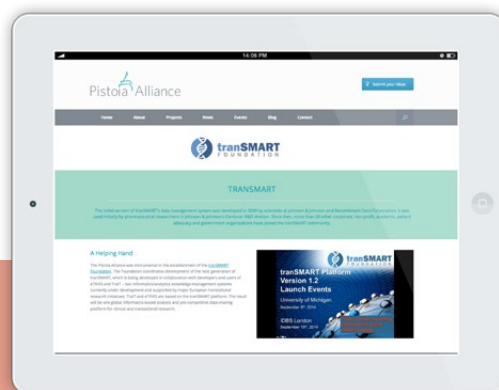
Pistoia Alliance: Lowering barriers to R&D innovation

The Pistoia Alliance is a global, not-for-profit alliance of life science companies, vendors, publishers, and academic groups that work together to lower barriers to innovation in R&D.

Our members collaborate as equals on open projects that generate significant value for the worldwide life sciences community.