



ACC Science & Research Highlights

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Predictive Analytics Toolkit (PAT)

Cloud Version and Web Video Tutorials Are Now Available

(note – highlighted text contains hyperlinks – you can also access PAT at <http://cox-associates.com/patkit/>)

The replacement of traditional toxicity testing with prediction modeling for determining hazards and risks is rapidly advancing.

- However, to establish scientific confidence in these prediction methods, robust statistical and analytical tools need to be used to document prediction model performance
- *The **Predictive Analytics Toolkit (PAT)** provides a point-and-click interface for conducting advanced prediction analysis from datasets assembled in Excel using R packages, even if the user does not know R*

PAT is now available at no charge on a cloud-based web platform; no software or add-ins are necessary, and there are no downloads!

- Web-based videos and written tutorials have been posted to provide step by step guidance for using PAT
- The tutorials walk new users through the process of using PAT with a pre-loaded dataset
- Additional tutorials instruct users on how to upload and analyze user developed Excel datasets
 - For users who have no knowledge of R, with a few mouse clicks, PAT will display results from advanced R packages without the need to learn R.
 - PAT can help identify the specific characteristics of chemicals and responses for which predictive models work well (or poorly).

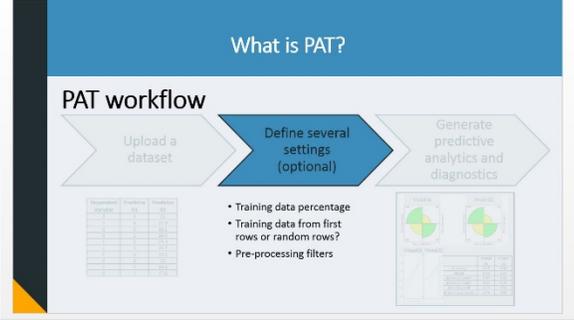
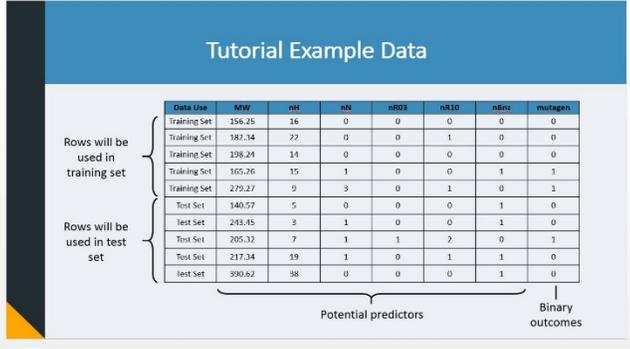
PAT can evaluate the performance of predictive models from HTS (e.g. ToxCast) or other (QSAR, omics etc.) datasets.

- PAT was used to analyze ToxCast/Tox21 data for the IARC Key Characteristics of Carcinogens in our paper [How well can carcinogenicity be predicted by high throughput “characteristics of carcinogens” mechanistic data?](#)
 - Data analytics using PAT showed that predicting cancer hazard from ToxCast/Tox21 data for each IARC key characteristic, alone or in combination, was no better than chance.
 - We concluded there is a lack of scientific confidence in inference models derived from current ToxCast/Tox21 assays for predicting cancer based on IARC’s key characteristics of carcinogens.
 - The Society of Toxicology’s Risk Assessment Specialty Section recognized this research by awarding it the 2018 Best Published Paper Demonstrating an Application of Risk Assessment

Click here to access the [PAT web tutorials](#) and to [try PAT out!](#)

(PAT is free, but new users must register by clicking the CloudCat link on the PAT landing page)

How to Use the Predictive Analytics Toolkit

Written Tutorials (in PDF format)	Video Versions of Tutorials (redirects to YouTube)
<p>1. Introduction to the Predictive Analytics Toolkit (PAT)</p> <p>Overview of topics covered:</p> <ul style="list-style-type: none"> § What is PAT? § What can PAT do? § How should input data be structured? 	<p>Introduction to the Predictive Analytics Toolkit (PAT)</p> 
<p>2. Running PAT using an Existing Dataset</p> <p>Overview of topics covered:</p> <ul style="list-style-type: none"> § Selecting a default (existing) dataset. § How to configure prediction options and run PAT. § How to interpret prediction model outputs (written only). 	<p>Running PAT using an Existing Dataset</p> 
<p>3. Running PAT on a User-provided Dataset</p> <p>Download the dataset used in the tutorial here.</p> <p>Overview of topics covered:</p> <ul style="list-style-type: none"> § How to upload, modify, and save a new dataset. § Using the top rows of a dataset as the training dataset. § Exporting results from PAT. § Interpretation of advanced outputs (written only). 	<p>Running PAT on a User-provided Dataset</p> 

For questions about the Predictive Analytics Toolkit or CloudCAT in general not covered in the instructions above, contact [Cox Associates](#).