



**QSPR is an application of machine learning**

- Machine learning [1]
  - “gives computers the ability to learn without being explicitly programmed” - Arthur Samuel (1959)
  - “A computer program is said to learn from experience  $E$  with respect to some task  $T$  and some performance measure  $P$ , if its performance on  $T$ , as measured by  $P$ , improves with experience  $E$ .” -Tom Mitchell (1997)

- In Quantitative Structure-Property Relationships (QSPR)
  - Experience E: chemicals
  - Task T: predicting physical property, e.g.
    - boiling point, chromatography retention times
    - activity against a biological target = QSAR
    - ADMET (absorption, distribution, metabolism, and excretion - toxicity)
  - Performance P: correlation/error in validation set/real-world applications



# QSPR is an application of machine learning

- Machine learning [1]
  - “gives computers the ability to learn without being explicitly programmed” - Arthur Samuel (1959)
  - “A computer program is said to learn from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E.” -Tom Mitchell (1997)
- In Quantitative Structure-Property Relationships (QSPR)
  - Experience E: chemicals
  - Task T: predicting physical property, e.g.
    - boiling point, chromatography retention times
    - activity against a biological target = QSAR
    - ADMET (absorption, distribution, metabolism, and excretion - toxicity)
  - Performance P: correlation/error in validation set/real-world applications

# Features/Descriptors