**Calibration and field evaluation of passive samplers for monitoring pesticides in water**

**Background**
- The continuous emissions of pesticides to the aquatic environment are posing a risk to wildlife and human health.
- The concentrations of pesticides in water vary temporally due to fluctuations in flow, precipitation, or episodic inputs.
- Passive sampling is a promising tool, allowing for continuous monitoring of an aquatic system over extended period of time:
  - i) time-weighted mean concentrations (TWMC)
  - ii) an easy tool to use
  - iii) high sensitivity due to collection of large volumes of water.

**Objectives**
- Characterization of passive samplers for over 100 individual pesticides in water.
- Evaluate the performance of passive samplers in comparison to time integrated active sampling.
- Evaluate the concept, challenges and application of passive sampling for future monitoring strategies in Sweden.

**Material and Methods**
- Comparison of six different passive sampler types:
  - i) POCIS A, ii) POCIS B, iii) Chemcatcher® SDB-RPS, iv) Chemcatcher® C18, v) silicone rubber (SR), and vi) low-density polyethylene (LDPE).
- Laboratory-based uptake study for individual pesticides.
- Evaluation of performance reference compounds (PRCs).
- Field application of passive samplers at two monitoring stations in Southern Sweden (Skåne and Halland).

**Conclusions**
- The n-octanol–water partition coefficient ($K_{OW}$) has been shown to be a good parameter to predict the suitability of the passive sampler for pesticides (Figure 1).
- The different passive sampler types tested in this study are suitable for measuring pesticides in Swedish rivers.
- POCIS A and POCIS B showed a better uptake performance for more polar compounds ($\log K_{OW} < 0$), whereas more hydrophobic compounds ($\log K_{OW} > 6$) were better taken up by SR and LDPE (Figure 2).
- Overall, the results of this study will improve our understanding of the concept, challenges and application of passive sampling for future monitoring strategies of pesticides in water.
- More work is required to compare the passive sampler results with active sampling in the field.

**References**