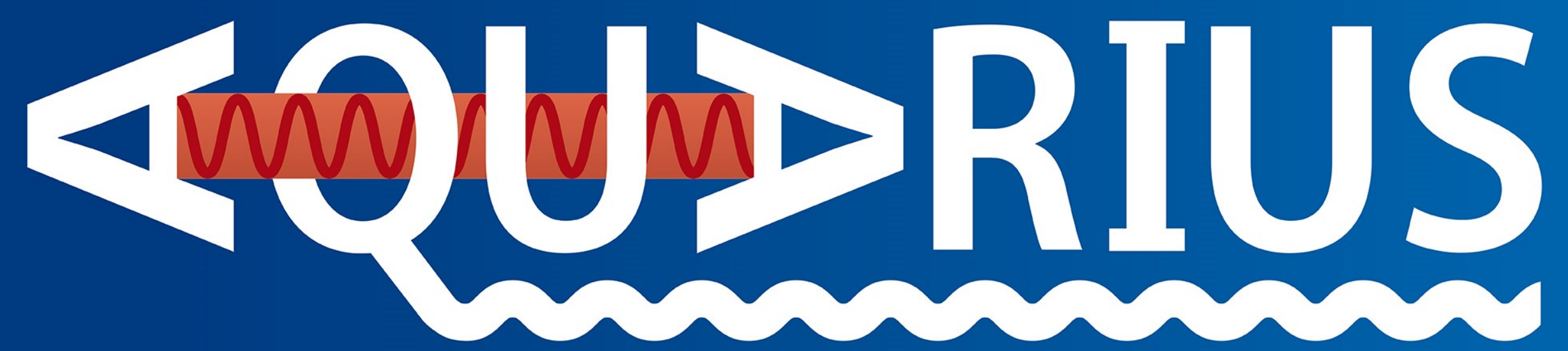


MISSION

AQUARIUS will provide an on- and inline capable mid-IR sensing solution to meet legal provisions for industrial waste water and drinking water monitoring.

Significant **enhancement in sensitivity** will be achieved by advancement of the laser source and the detector as well as an **innovative combination of sample extraction and preparation**.

The **AQUARIUS** sensing solution will be developed along the **entire value chain** towards integration in industrially proven online devices for water control driven by **strong industrial commitment** in this consortium.



Broadband Tunable QCL based Sensor for Online and Inline Detection of Contaminants in Water

OBJECTIVES

- Enhancement of broadband tunable quantum cascade lasers in terms of spectral coverage and noise (TRL increase: from 4 to 6)
- Realisation of a fully functional spectrometer sub-system consisting of a μ EC-QCL and a fast MCT detector including data acquisition (TRL increase: from 3 to 6)
- Advance Oil-in-Water (OiW) monitoring capabilities from offline (state-of-the-art) to online (TRL increase: from 3 to 6)
- Test of the online OiW system at industrial end users (TRL 7)
- Realisation of integrated optical circuits (IOCs) for waveguide based sensing and inline capable sensing configuration (TRL increase: from 2 to 4)
- Assembly and test of the inline OiW system in a laboratory environment (TRL increase: from 2 to 4)

MOTIVATION

- Ensuring highest possible water quality is the driving force behind this project
- The variety and concentration of chemical species in the aquatic systems can be quite diverse, presenting a challenge in terms of both water purification strategies and water quality control.
- Thousands of contaminants are used every day and new ones are continually put on the market. Increasingly effective laboratory detection techniques are now revealing the presence of low concentrations of contaminants.
- Novel water monitoring technologies are needed for all types of water. These new technologies shall enable **pervasive water monitoring**, which can replace and compliment currently employed laboratory based offline methods by online or inline monitoring strategies.

TECHNICAL APPROACH

The **AQUARIUS** project is planned to run for 36 months and subdivided into eight work packages (WP). Between those work packages there are significant dependencies and expected synergies.

WP1 Requirements and specifications for Online and Inline OiW analyser is a foundation point for AQUARIUS execution. The main objective is to derive requirement definitions and specifications for the system, as well as sub-systems and modules.

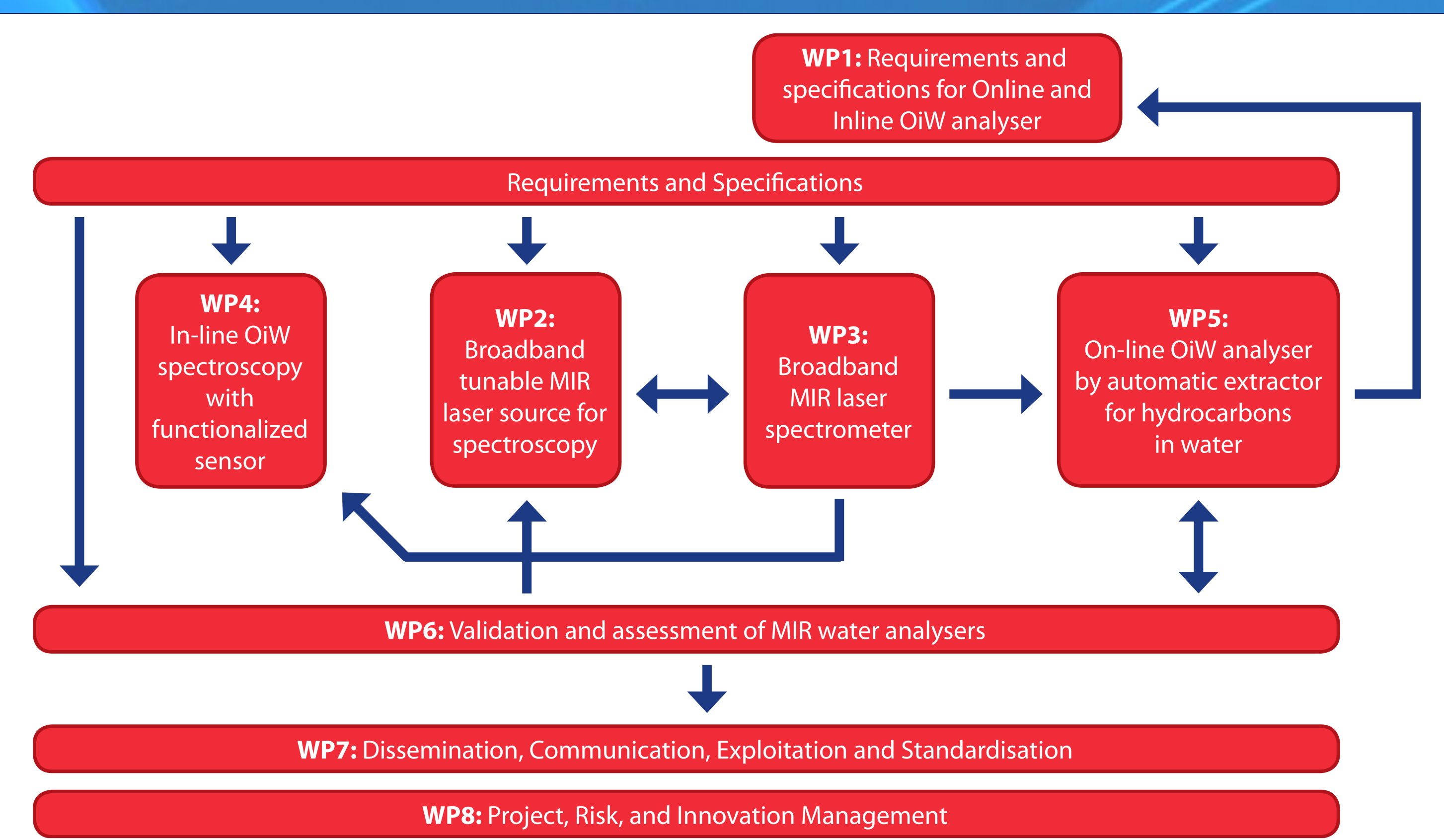
WP2 Broadband tunable MIR laser source for spectroscopy will focus on the design, growth and processing of quantum cascade lasers and optical components for fast spectral scanning within the mid-infrared range.

WP3 Broadband MIR laser spectrometer covers the development of a high-speed mid-infrared spectrometer for transmission and attenuated total reflection spectroscopy of OiW samples.

WP4 Inline OiW spectroscopy with functionalized sensor shall develop a compact demonstrator of a sensing system for fast and direct (inline) mid-IR spectroscopic measurement of liquids for determination of the parameter OiW.

WP5 Online OiW analyser by automatic extractor for hydrocarbons in water will design and develop a system for enhanced online OiW analysis, towards a concept prototype.

WP6 Validation and assessment of MIR water analysers will perform validation and assessment of the online and inline OiW analysers.



WP7 Dissemination, communication, Exploitation and Standardisation obtains input from other WPs, focusing on scientific research and ensures the communication and dissemination of results achieved within the WPs to the outside parties and participating entities. WP7 also supports the partners to exploit the achieved results and impact the European and international market. The ethical and societal impact of the project will be closely monitored and reported on.

WP8 Project, Risk and Innovation Management will interact with all other WPs in order to ensure a successful project lifetime with respect to risk and innovation management. WP8 depends on all other WPs. Furthermore it performs scientific coordination to reach the common goal of AQUARIUS.

Key Data:

Start Date: 01 st January 2017	Consortium: 8 partners (5 countries)
End Date: 31 st December 2019	Project Coordinator: Dr. Klaus-Michael Koch
Duration: 36 months	coordination@aquarius-project.eu
Project Reference: 731465	Technical Leader: DI Wolfgang Ritter
Project Budget: € 3.891.263,75	w.ritter@quantared.com
Project Funding: € 3.891.263,75	Project Website: www.aquarius-project.eu

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 Technische Universitaet WIEN, Austria
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 OMV Exploration & Production GmbH, Vienna / Austria

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