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ESSEN

Open-Minded



AQUATIC
ECOSYSTEM
RESEARCH

ZWU

ZENTRUM FÜR
WASSER- UND UMWELTFORSCHUNG



cost
EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY



University of Duisburg-Essen, Dept. of Biology, Aquatic Ecosystem Research Group (Prof. Leese) - eDNA expertise for ECOBIAS

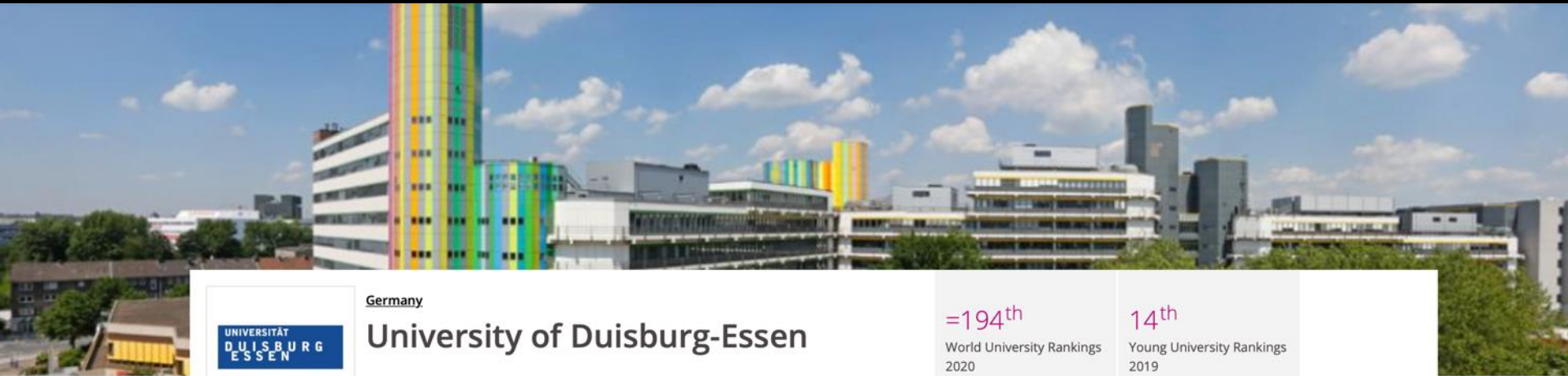
Cristina Hartmann-Fatu, Martina Weiss

Universität Duisburg-Essen, Deutschland
Prof. Leese: Chair der EU COST Action DNAqua-Net
German Barcode of Life, GeDNA-Projekt

[@leeselab](#) [@dnaquanet](#)



University of Duisburg-Essen – a leading young European University in aquatic biomonitoring



UNIVERSITÄT
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Offen im Denken

Germany

University of Duisburg-Essen

=194th

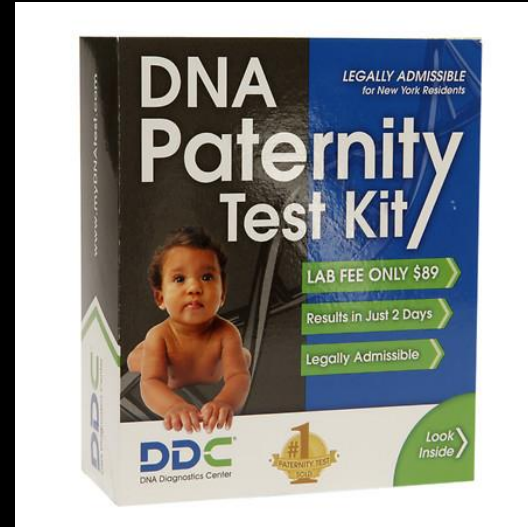
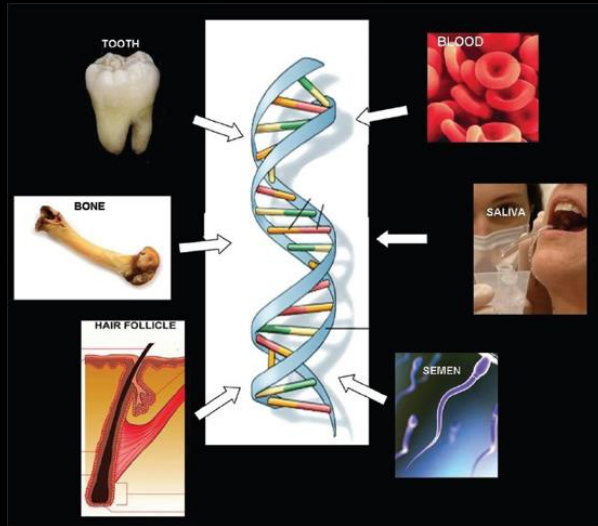
World University Rankings
2020

14th

Young University Rankings
2019

- Times Higher Education Ranking: Place 14th of all international universities < 50 years
- First German university with a focus on water research
- Expertise in aquatic biomonitoring (Prof. Hering, Prof. Sures, Prof. Leese - ZWU)

Our role in ECOBIAS is to showcase how DNA can improve biomonitoring



DNA is everywhere – we use it in forensics and for parentage analyses, but it can do so much more.

@leeselab

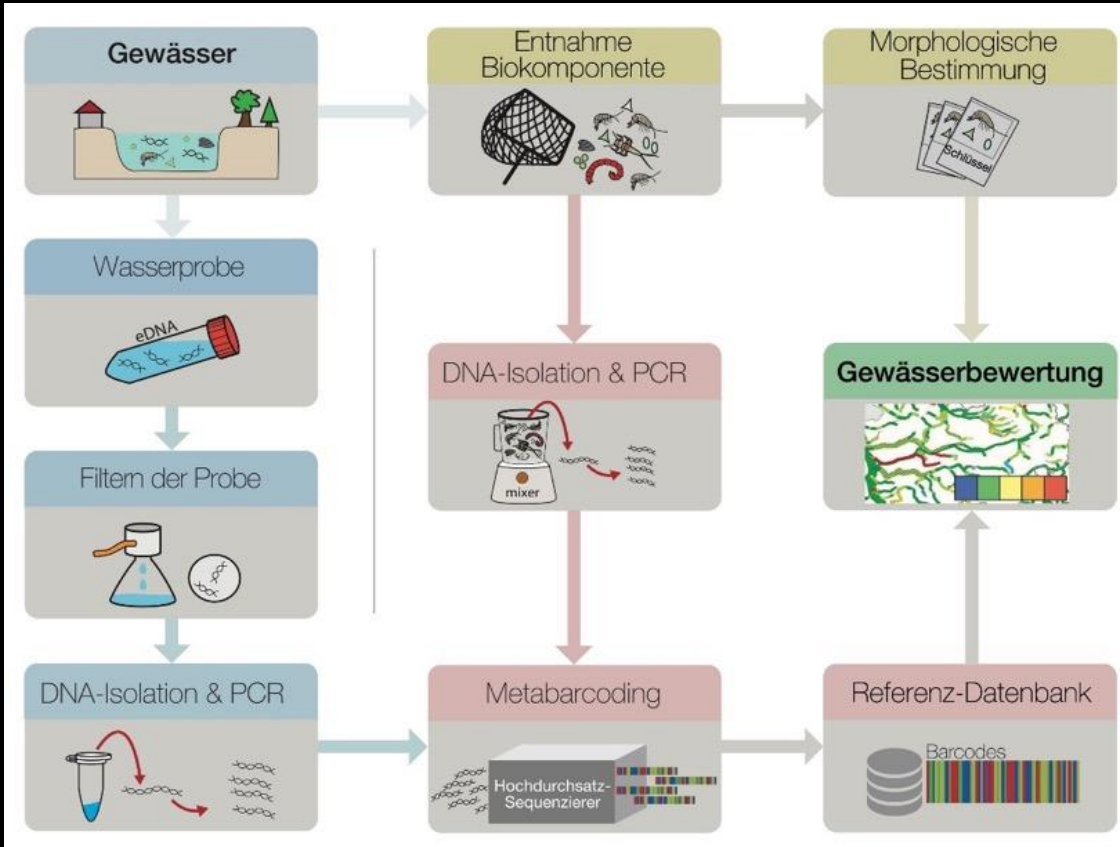


Detect whole communities using eDNA

(environmental DNA, e.g. water sample)



Two new biomonitoring ways (blue and red)



Yellow: traditional morphological bioassessment

Blue: eDNA metabarcoding

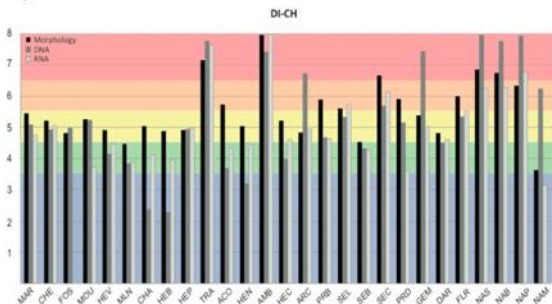
Red: multi specimen metabarcoding

Leese, Hering, Wägele (2017)
Wasserwirtschaft

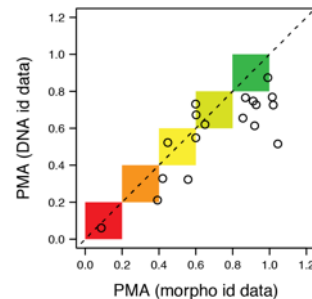
Including eDNA based methods in biomonitoring

Environmental Monitoring: Inferring the Diatom Index from Next-Generation Sequencing Data

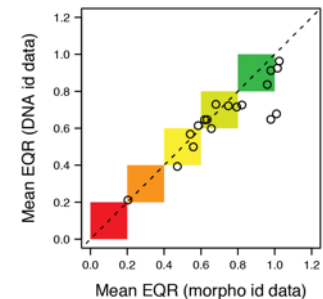
Joana Amorim Visco,[†] Laure Apothéloz-Perret-Gentil,[†] Arielle Cordonier,[‡] Philippe Esling,^{†,§}
Loïc Pillet,^{†,||} and Jan Pawlowski^{*,†}



C) PMA (rel. abund. data)



D) Mean EQR (mean of A, B & C)



Assesment: Bad Poor Moderate Good High

Elbrecht et al. (2017)

Several recent studies, including ours, show that eDNA based methods are compatible with traditional methods – but faster and cheaper.

→ We strive to teach these new methods in theory and practice during the curriculum development and the summer school in ECOBIAS

We have collaborations with 49 nations
and will share this with ECOBIAS

Our aim is to advance the application of DNA-based tools for biodiversity assessments & to develop a roadmap including these in standardized bioassessments of aquatic ecosystems in Europe and beyond!

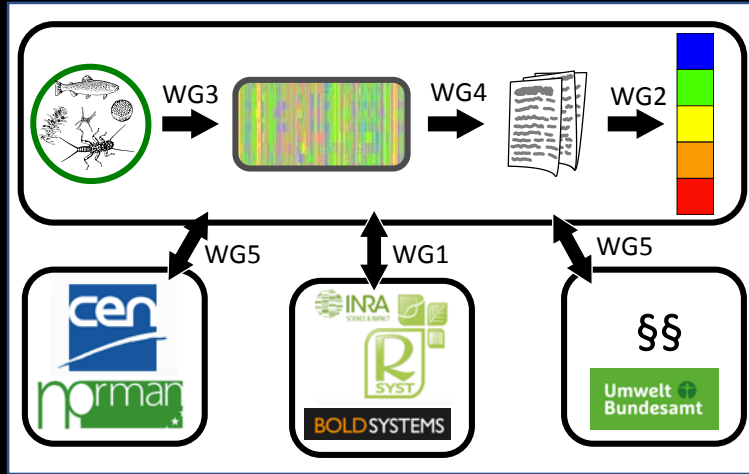


EU COST Action DNAqua-Net (2016 – 2020+)

Leese et al. (2016)

DNAqua-Net

@dnaquanet



- started 2016
- ~ 600 members
- 49 official member states
- > 60 biomonitoring publications on eDNA etc.
- > 50 research exchanges, > 45 meetings & round tables
- training schools, e.g. Bucharest, Uppsala (2018 & 2019)
- ECOBIAS will profit from our experience



Looking forward to collaborating with you!



Bundesministerium
für Bildung
und Forschung



@leeselab @dnaquanet



<https://dnaqua.net>