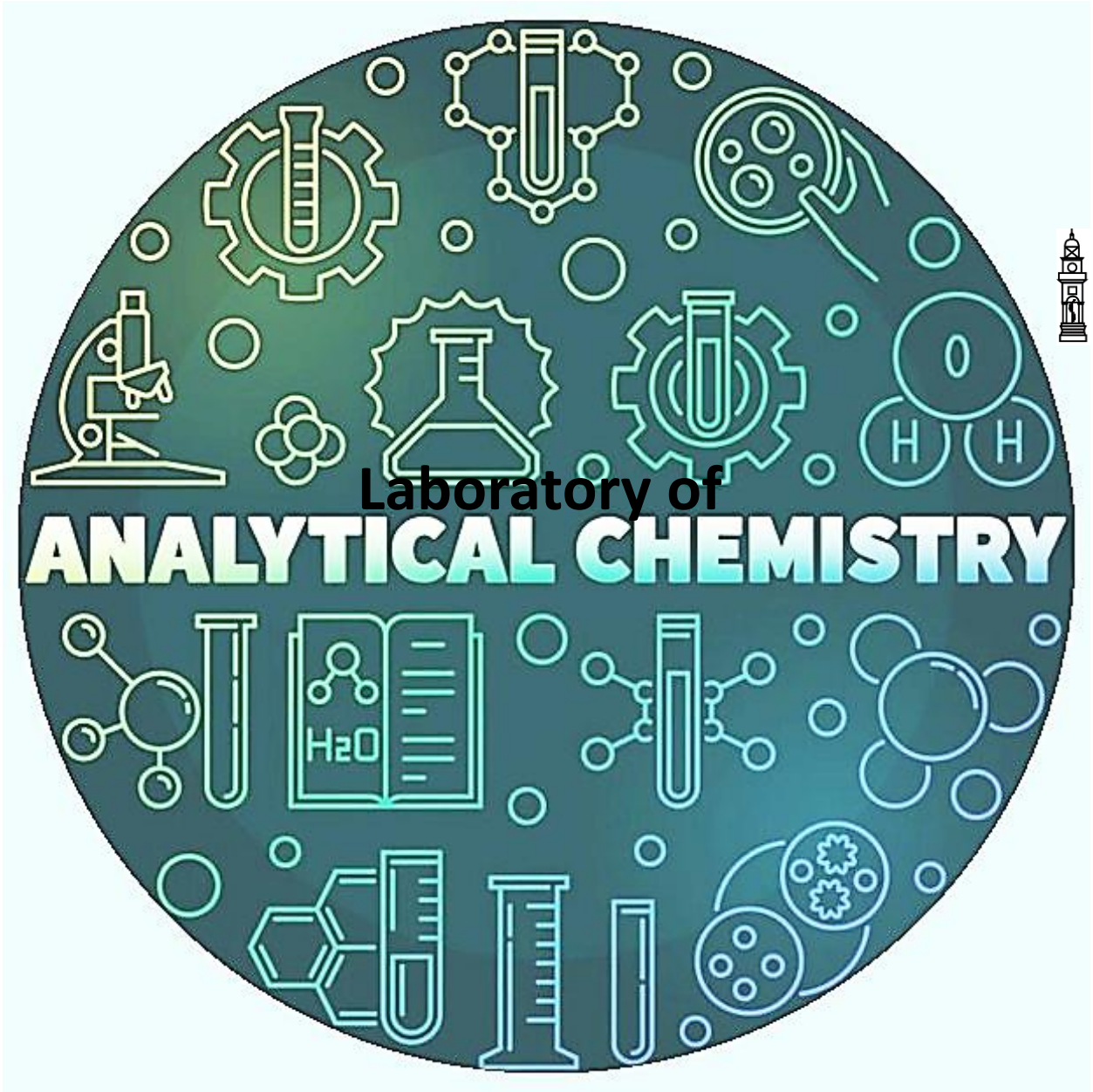
Department of Chemistry



ΙΝΣΤΙΤΟΥΤΟ
ΕΠΙΣΤΗΜΗΣ ΥΛΙΚΩΝ
ΚΑΙ ΥΠΟΛΟΓΙΣΜΩΝ

Dimosthenis L. Giokas (Assoc. Prof.)

Equipment and Instrumentation

ΙΝΣΤΙΤΟΥΤΟ
ΕΠΙΣΤΗΜΗΣ ΥΛΙΚΩΝ
ΚΑΙ ΥΠΟΛΟΓΙΣΜΩΝ

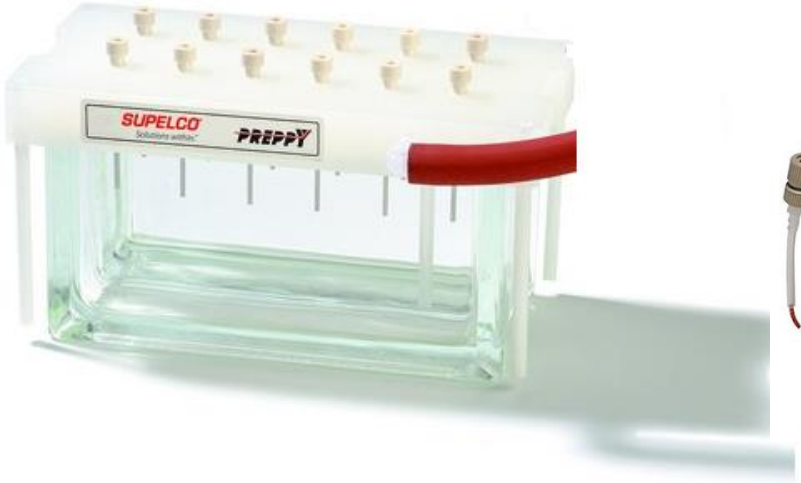
SHIMADZU
FAAS / ETAAS / HGAAS

SHIMADZU
HPLC UV/FL/CONDUCTIVITY

JENWAY
UV-VIS

Equipment and Instrumentation

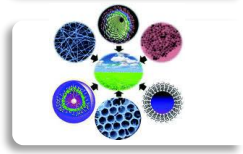
ΙΝΣΤΙΤΟΥΤΟ
ΕΠΙΣΤΗΜΗΣ ΥΛΙΚΩΝ
ΚΑΙ ΥΠΟΛΟΓΙΣΜΩΝ



Sample preparation - Microextraction

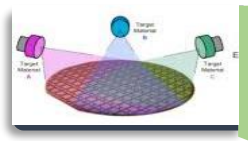
Emerging pollutants including nanomaterials

01



Environmental remediation

02



Chemical sensors

(based on optical methods)

03

Equipment-free analytical assays / point-of-need analytical devices

04

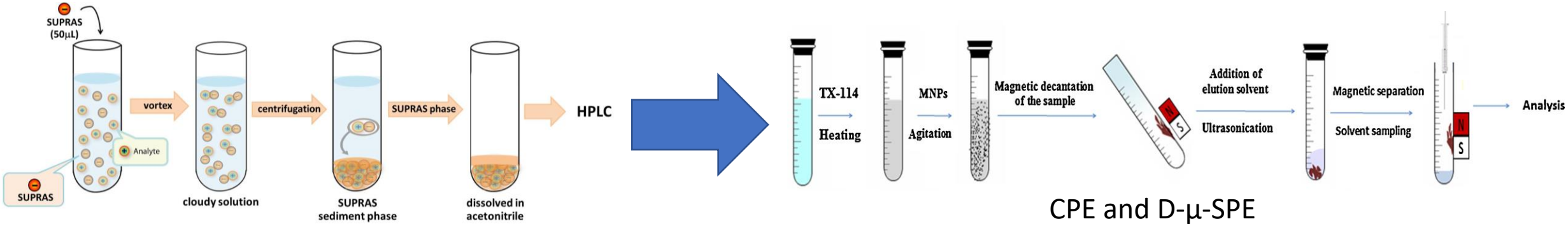
Principle: Adsorption and desorption of analytes

Common approach

Use of micro/nano sorbents for extraction / microextraction

Our approach

Combined microextraction methods

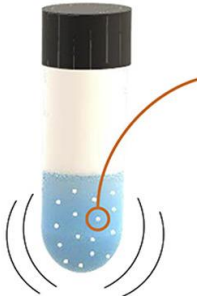


CPE and D-μ-SPE

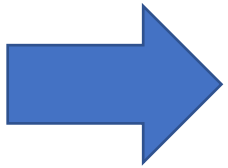
Journal of Chromatography A 1251, 2012, 33-39

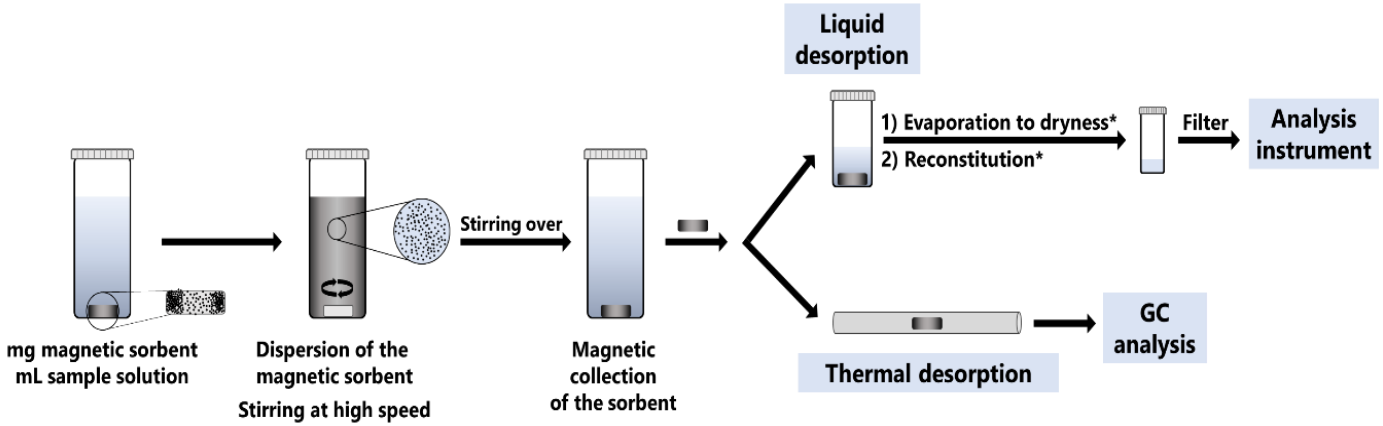
Microchimica Acta 180, 2013, 775-782

SBSE

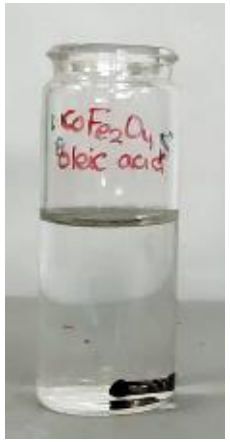


D-μSPE





SBSDμE



SBSE

SBDμSPE

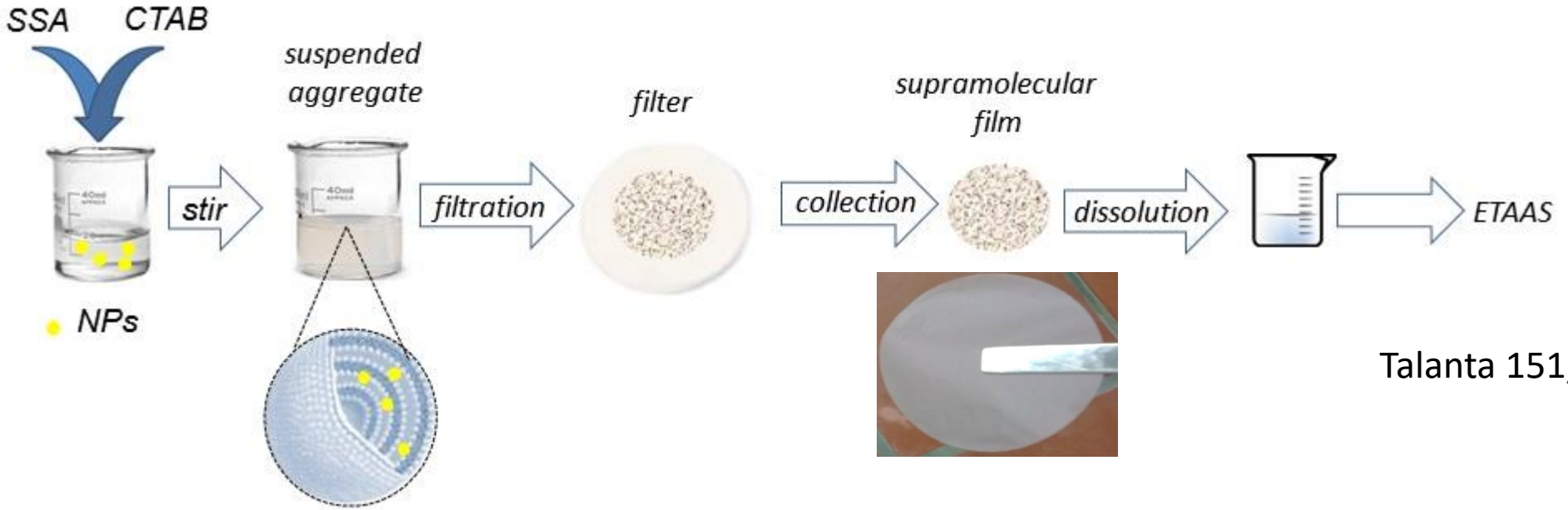
Journal of Chromatography A 1362, 2014, 25-33
Highlighted Article in Microextraction Tech
(http://microextraction.blogspot.com/2014/11/stir-bar-sorptive-dispersive.html)

Talanta 147, 2016 246-252

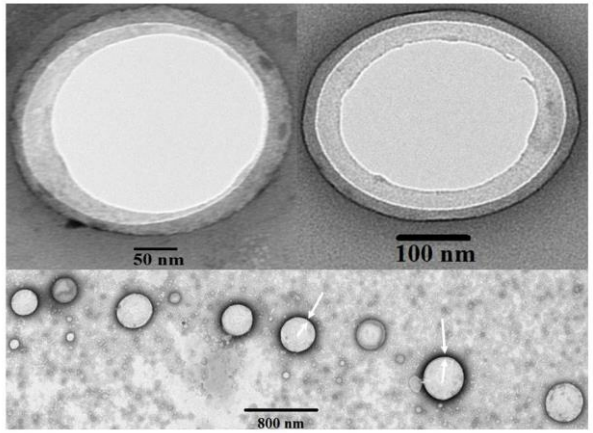
Analytica Chimica Acta, 926, 2016, 63-71

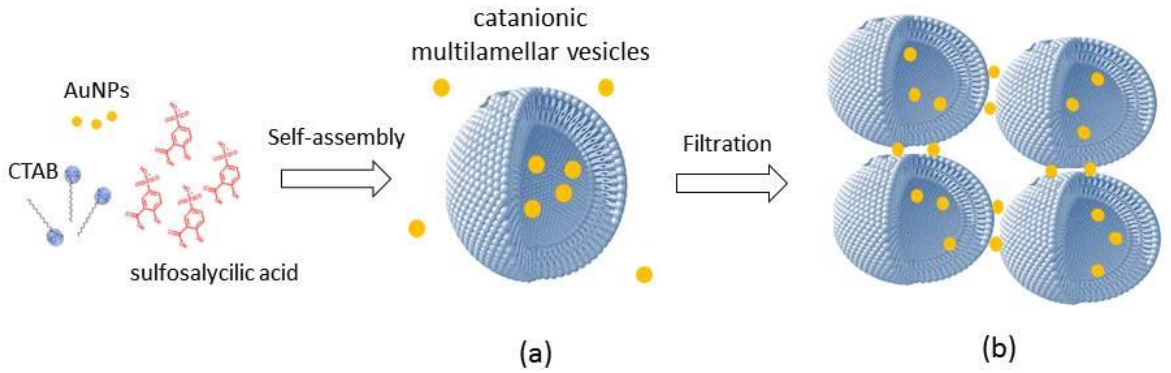
Journal of Chromatography A, 1564, 2018, 25-33

Microextraction of nanoparticles from environmental samples



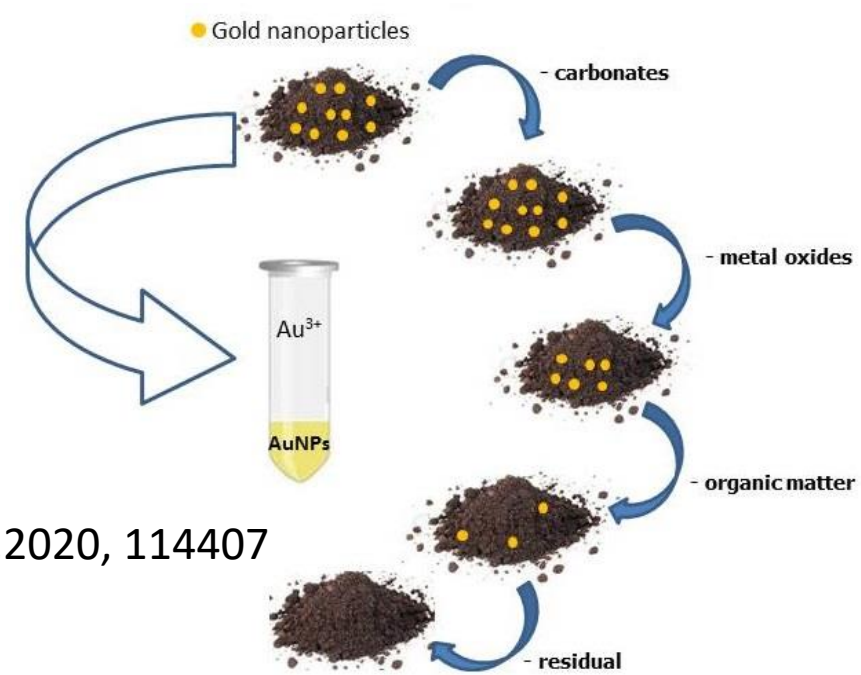
Talanta 151, 2016, 91-99



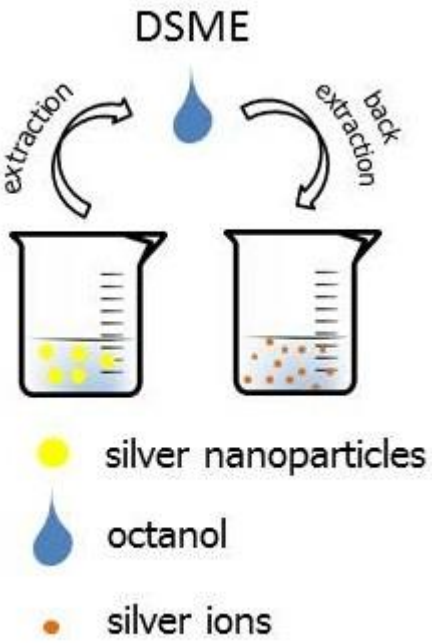


Microextraction of nanoparticles from environmental samples

Analytical Methods, 12, 2020, 368-375



Environmental Pollution 263,2020, 114407



Talanta, 196, 2019, 255-261

Common approach

Adsorbents (micro/nanomaterials) dispersed in aqueous medium

Batch adsorption studies

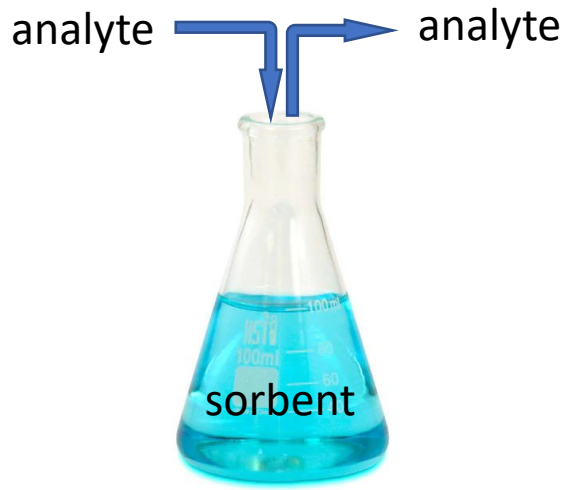
Adsorption isotherms in distilled water

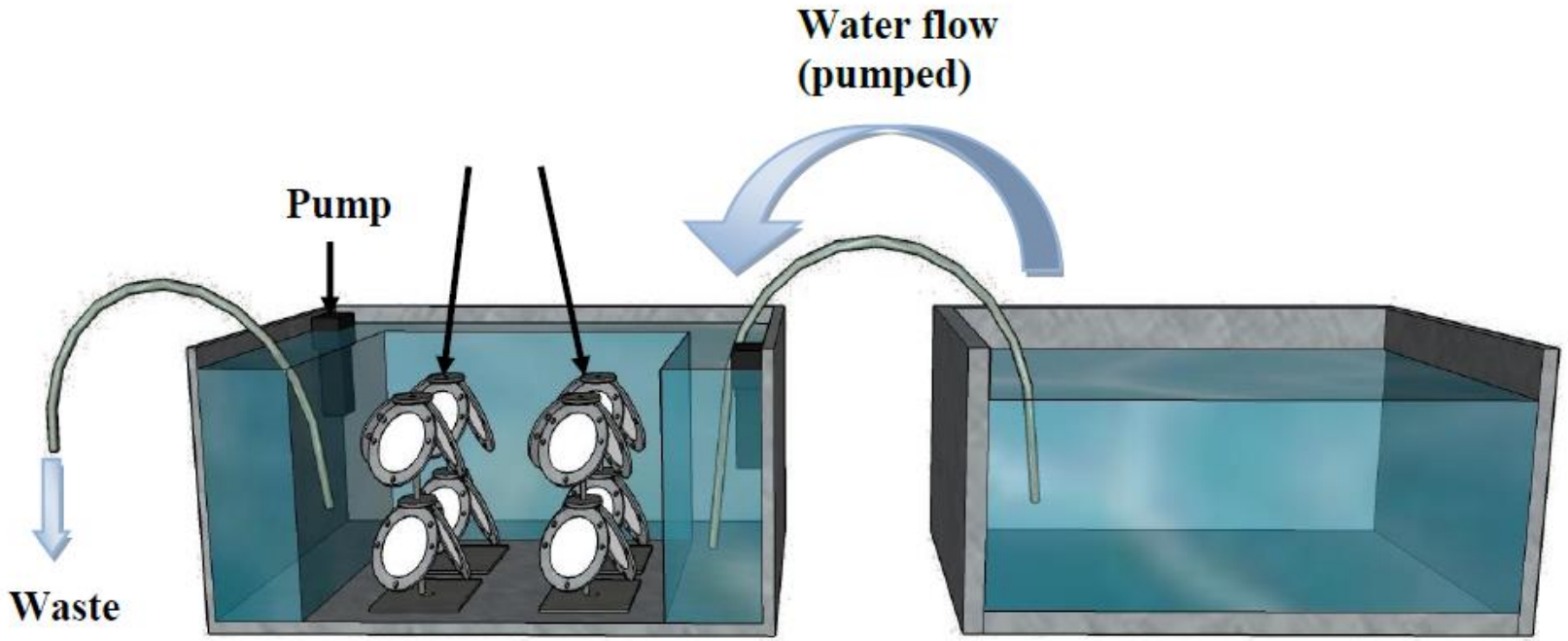
Our approach

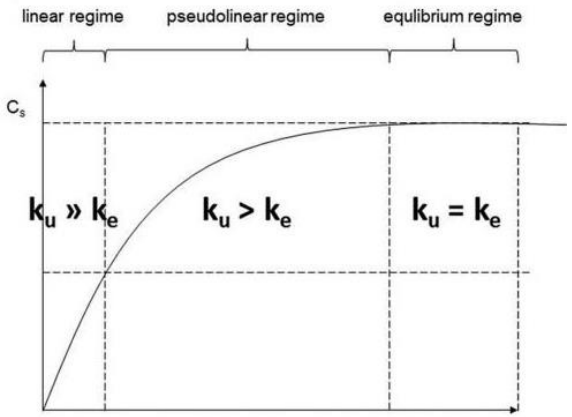
Adsorbents (nanomaterials) immobilized onto solid supports

Real-time adsorption studies

Sampling rate in real samples

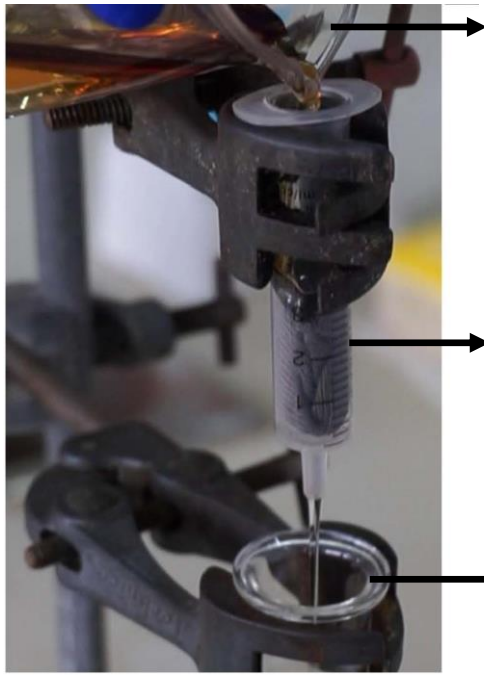






$$R_s = \frac{C_s \times M_s}{C_w \times t}$$

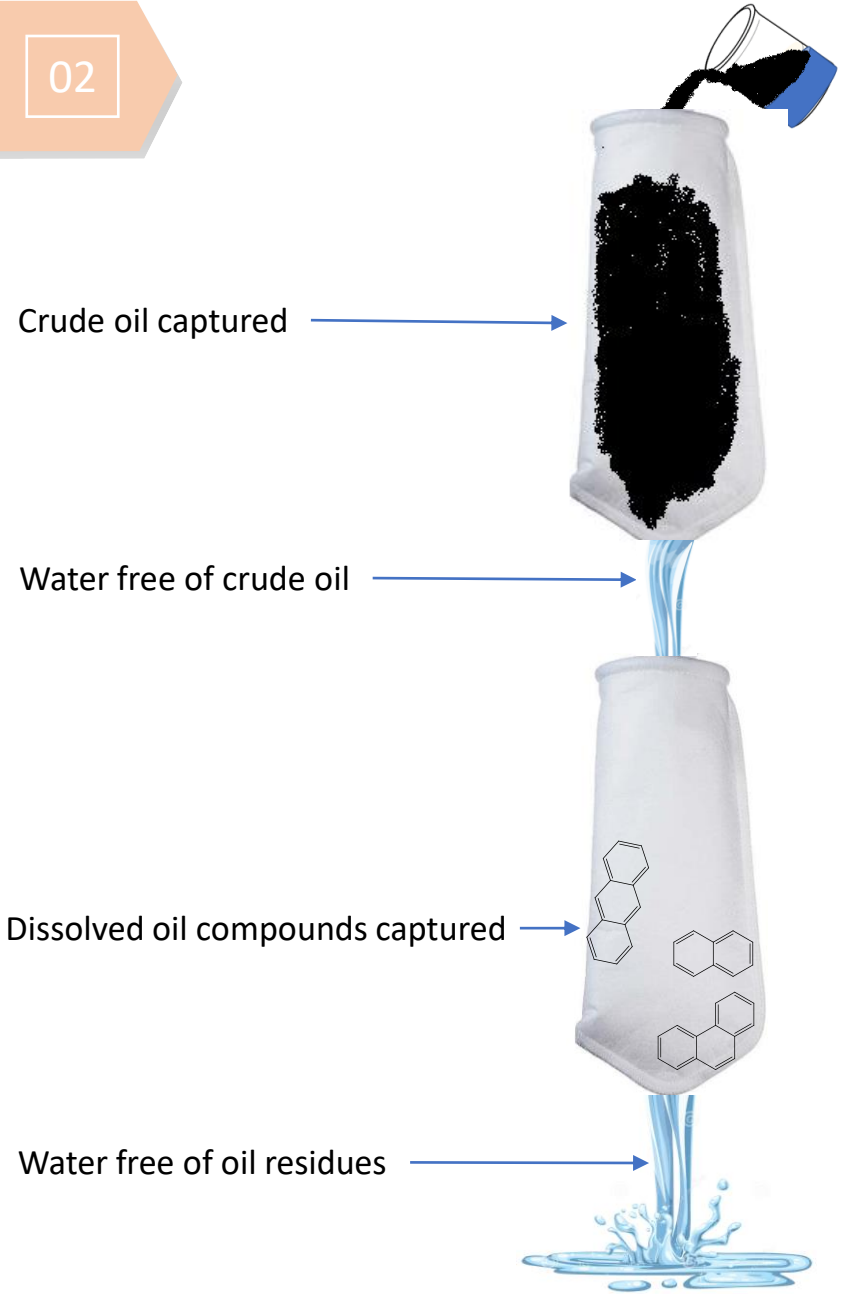
C_s is the analyte concentration in the sorbent (ng/g),
C_w is the analyte concentration in the solution (ng/L) after the time t
M_s is the mass of sorbent (g).



Oil in water

FILTER

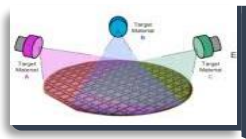
Clear water



Flow rate 100lt / min × m^2

in cooperation with

nanoviis
INNOVATIVE NANOTECHNOLOGIES



Chemical sensors
(based on optical methods)

03

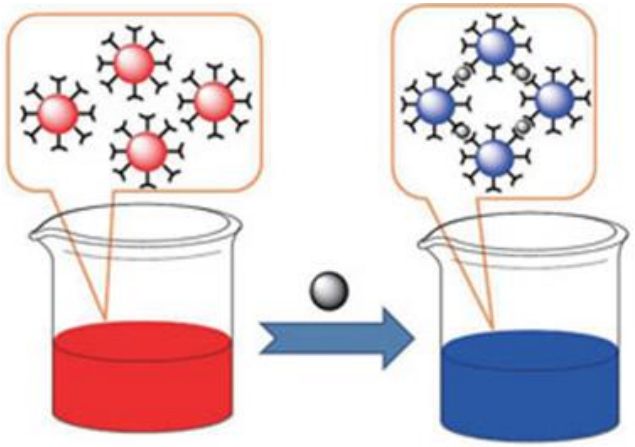
Equipment-free analytical assays / point-of-need analytical devices

04

ΙΝΣΤΙΤΟΥΤΟ
ΕΠΙΣΤΗΜΗΣ ΥΛΙΚΩΝ
ΚΑΙ ΥΠΟΛΟΓΙΣΜΩΝ

Common approach

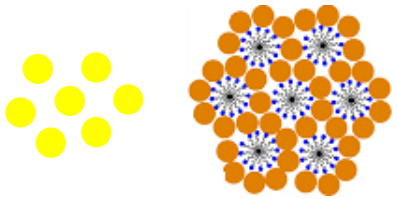
Pre-formed nanomaterials



Our approach

Analyte-mediated formation of nanomaterials

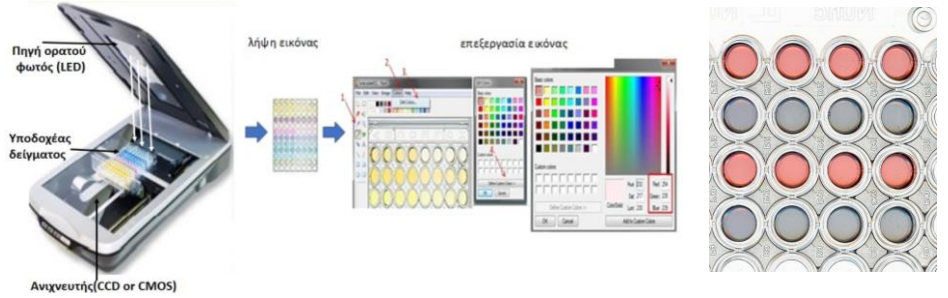
Me^{n+} Metal coated micelles

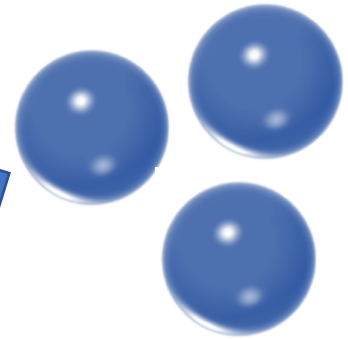


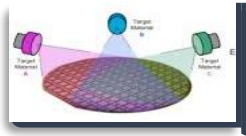
without analyte

Reducing agent
Metal seeds
UV-Vis irradiation

analyte







Chemical sensors
(based on optical methods)

03

Equipment-free analytical assays / point-of-need analytical devices

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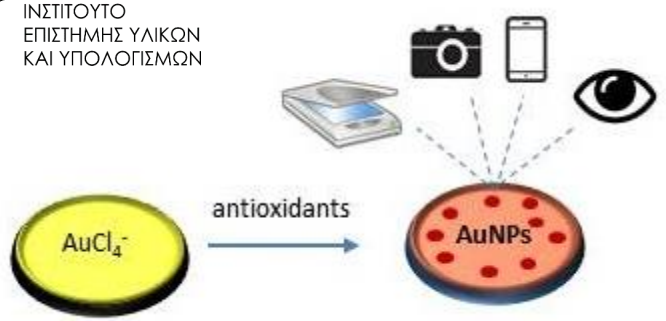
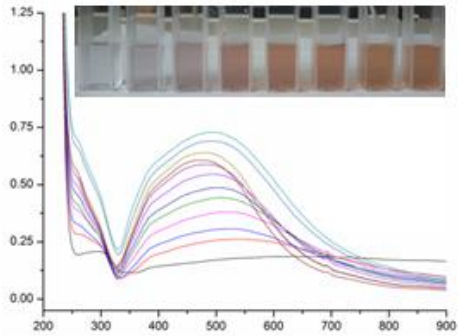
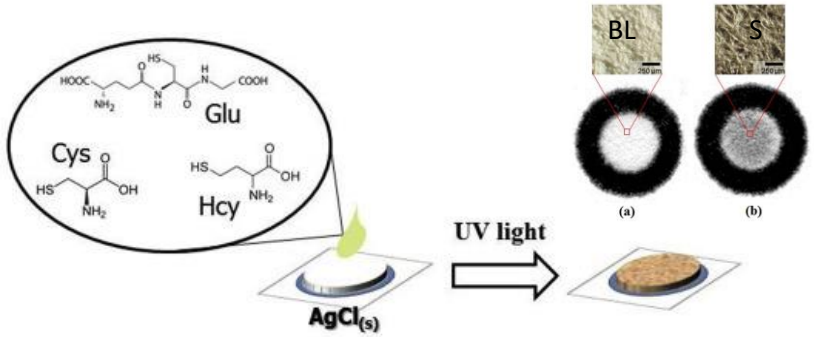


Analytica Chimica Acta 860, 2015, 61-69

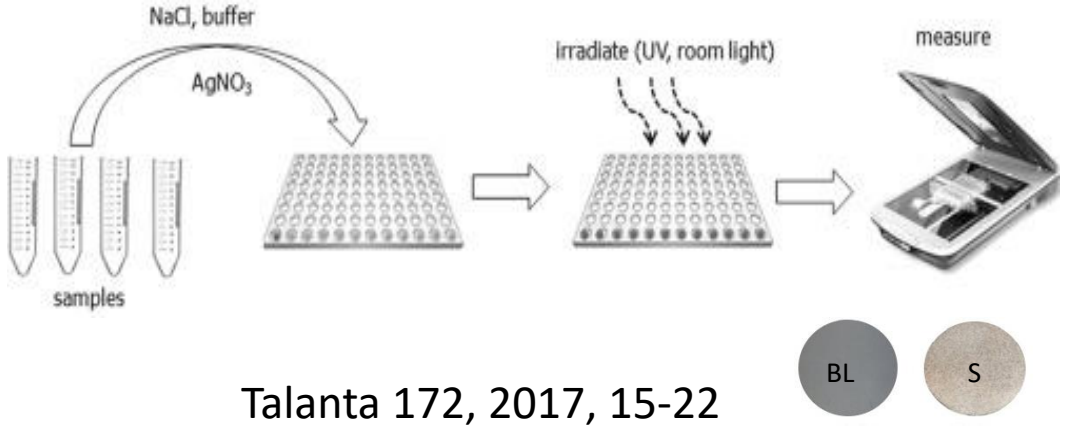
$Ag^+ + DOM \xrightarrow{UV\ (\lambda=365\ nm)} AgNPs$



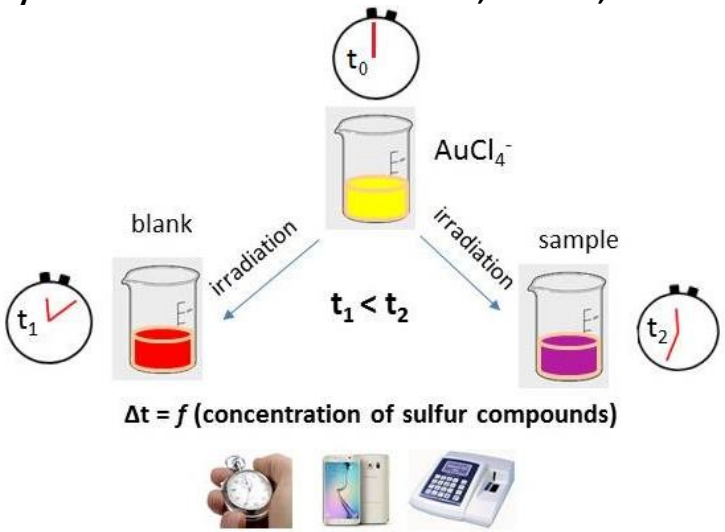
Analytica Chimica Acta 812, 2014, 121-128



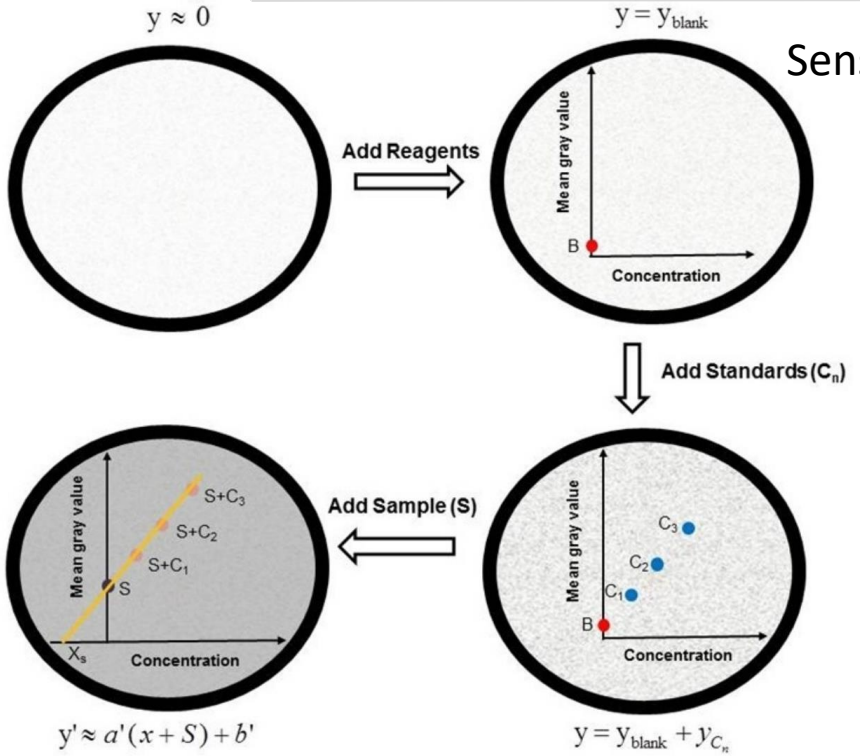
Analytica Chimica Acta 1036, 2018, 89-96



Talanta 172, 2017, 15-22

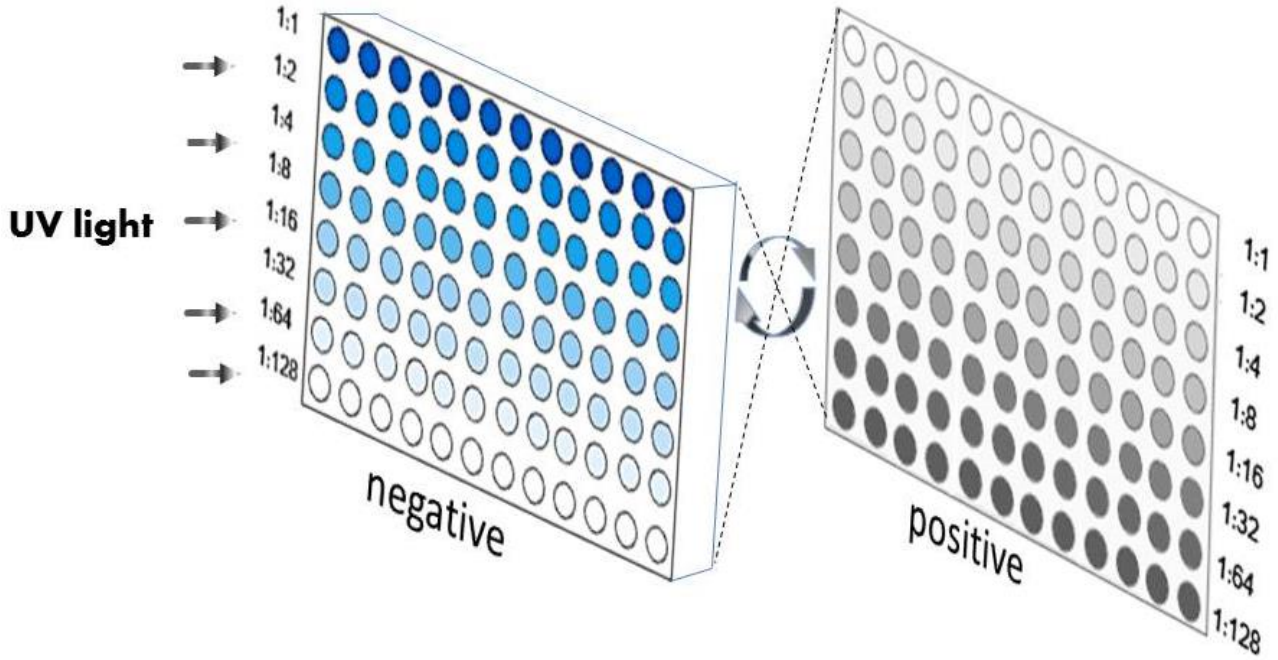


ACS Omega 2018, 3, 12, 16831–16838

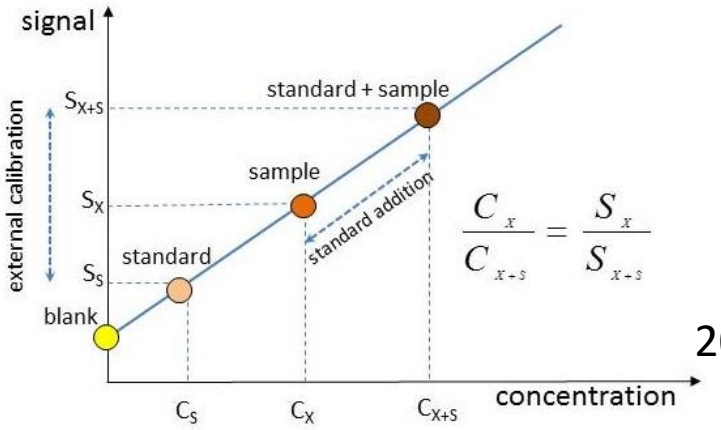


Sensors and Actuators B: Chemical
253, 2017, 860-867

Photography-based photometry



Sensors and Actuators B: Chemical
328, 2021, 129018



Talanta
201, 2019, 149-155

Our team

- Prof. Athanasios Vlessidis
- Mrs. Tatiana Choleva (PhD)
- Mrs. Charikleia Tziasiou
- Mrs. Vasiliki Gouma
- Mr. Elias Moisiadis
- Mrs. Despoina Gkogkou

Patras Science Park
Επιστημονικό Πάρκο Πατρών

ΙΝΣΤΙΤΟΥΤΟ
ΕΠΙΣΤΗΜΗΣ ΥΛΙΚΩΝ
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H.F.R.I.
Hellenic Foundation for Research & Innovation

Περιφέρεια Ηπείρου
Region of Epirus

European Union
European Social Fund

Operational Programme
Human Resources Development, Education and Lifelong Learning
Co-financed by Greece and the European Union

ΕΣΠΑ 2014-2020