Pigment intercomparison
Introduction to discussion

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Intercomparisons

- Full Round Robin for primary pigments (HIB-1,2,3 – JRC-max. 6 labs)
- Youden and Steiner (MVT, NIVACal I and II, Sørensen et. al., 2007) Only for Chl-a (HPLC and Spectrophotometric, 20 labs in 2007).
- Z-score (www.quasimeme.org). Chl-a and pheaopigments only (many labs, they prepare around 200-250 samples)

Cost for Round Robin for all primary pigments

- Preparation of the HPLC and a new test
  - Setup up of new a method: 10 days
  - Optimalization of method: 10 days more
- The Round Robin test
  - Pigment standards/column e.g. 4500 Euro
  - Calibration with standard : 3 – 5 days
  - Participation in the Round Robin: 10 days
- To participate in a full Round Robin on all primary pigments starting from the beginning with one should need in total 2 manmonth of work for a trained chemist.

The MERIS product definition

Name of product (variable number, mode number in table 9)	Geophysical component Definition	Optical component Definition	Method of measurement
Algal pigment index Chl1 (7.n)	Concentration of chlorophyll a + divinyl-chlorophyll a + chlorophyll a' + phaeopigments (?)	N/A	Filtration of all water particles, extraction of pigments[1], determination of chlorophyll using HPLC[2] Unit: $mg.m^{-3}$
Algal pigment index Chl2 (8.n/9.n/10.n)	Chlorophyll a concentration	$26.212 * \langle a_{ph}(442) \rangle^{0.7735}$ where a_{ph}: the absorption of the bleachable fraction of the material, which does not pass the filter, *i.e.* the difference between the absorption of the filter pad before and after bleaching.	*Idem (chl.2.hplc, var. no. 9))* Note that a value of 2. for the "beta factor" must be adopted (see RD1, Table 2 p. 137) Chlorophyll a concentration (chl.2.a442, var. no. 8) measured as absorption per COLORS protocols RD7 (TBC) (filter pad absorption method)

Geophysical componets definition

- AP1. Chl1 (case1) = Chl-a + DV-Chla, Chl-a allomer, Chl-a isomer, Chl-a ”pheaopigments” (Chlide-a, Pheaophorbide-a, Pheaophytine-a)
  - Are the validation teams analysing all of these pigments?
  - Some only do TChla=Chl-a+DV-Chla+Chlide-a.
  - Whats in the MERMAID database?
- APII. Chl2 (case2) = Chl-a
  - Chl-a_HPLC are used as an proxy for all 443 absorbing pigments in coastal waters
  - Should have included other 443 absorbing pigments in the definition since they can give a significant contribution to the reflectance.
  - So, is it correct to only use Chl-a as the geophysical definition in coastal waters?

Quasimeme Laboratory Performance Studies to be investigated.

- Standard cost for Chl-a and Pheopigment 700 Euro (Spectrophotometric and HPLC)
- Co-operation are discussed with Steven Crum and Ann-Marie Ryan in Quasimeme
- They have samples for earlier Chl-a performance test that can be used in a Round Robin for the MVT
  - We need to test if the old material contains all the proper pigments we want to test/to be included
  - Additional samples from old test rounds costs 140-180 Euro depending how many are ordered
- Use their site facilities, logistics, homogenity tests and statistical evaluation
  - Set up a new test with the proper test material
  - Extra cost need to be determined

Questions/next steps!

- How many labs will participate?
- How many will do the HPLC and how many spectrophotometric?
- What pigments are in the MERMAID data for Chl1 and Chl2?
- Agreement on the pigment definition for Chl1 (API) and Chl2 (APII).
- Find the best practically and scientific intercomparisons of pigments for MERIS product validation.