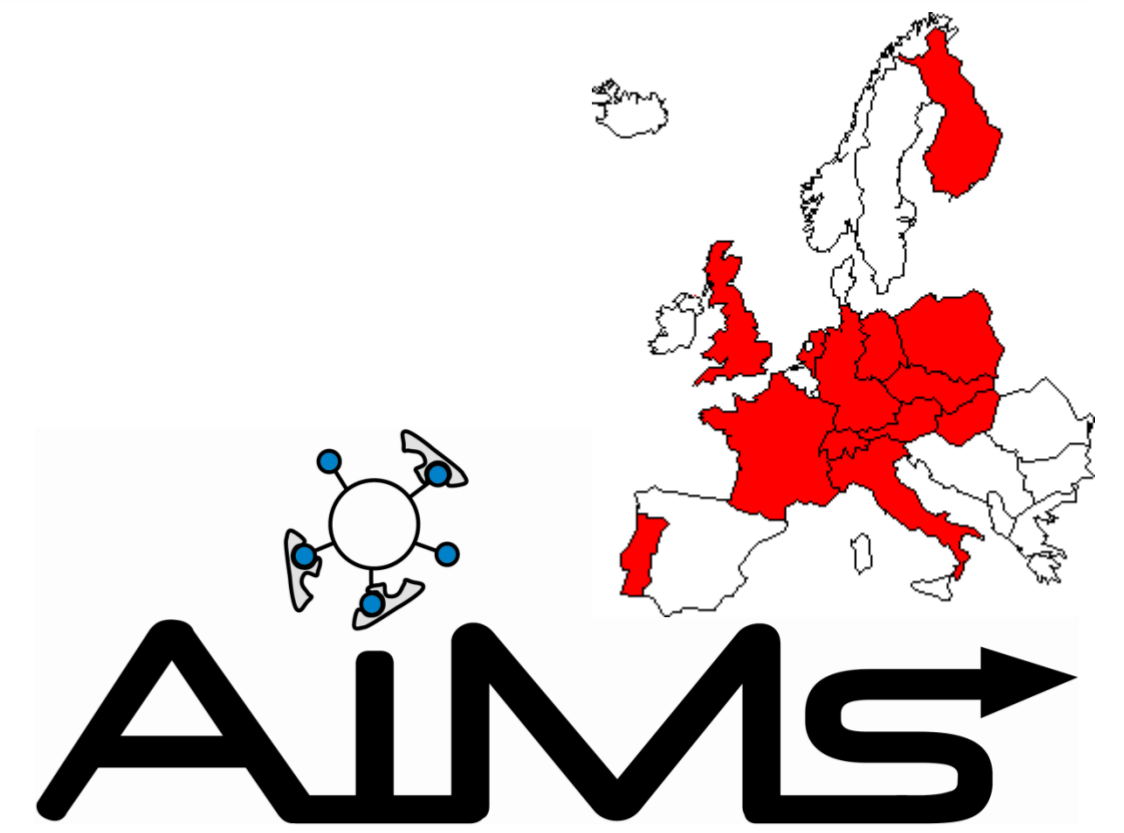


# Affinity extractants for selective recovery of IgG from proteins

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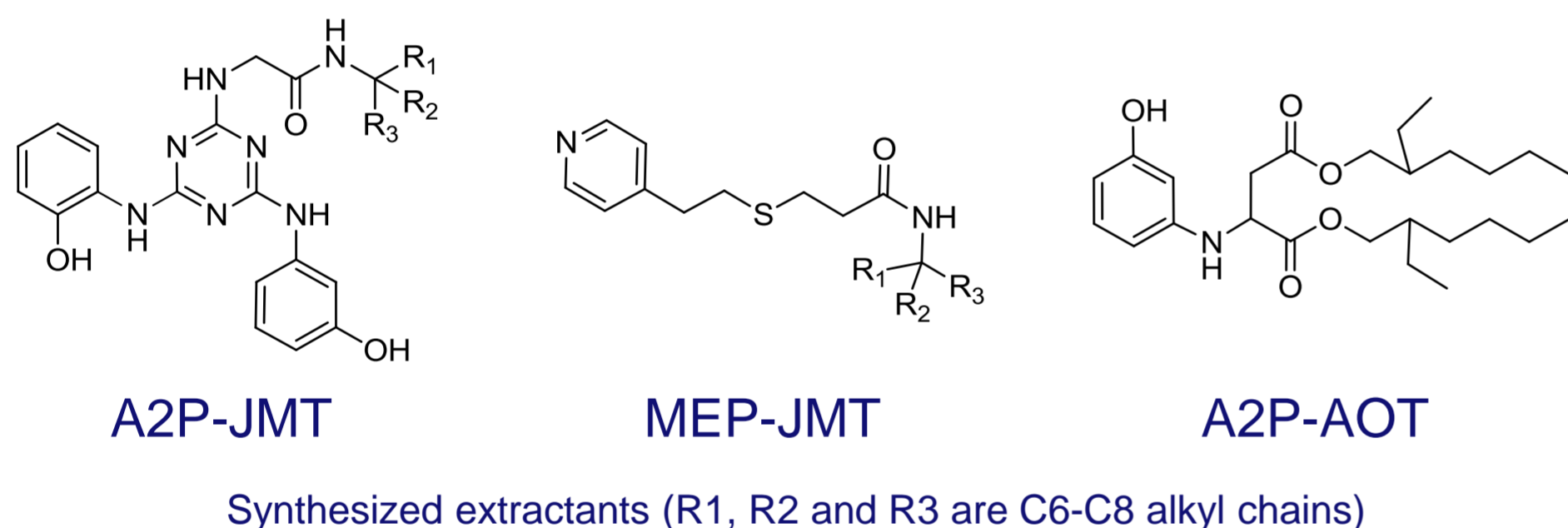
## Incentive:

- High purity and low concentrations current cell lines make downstream processing major part of the production costs for monoclonal antibodies.
- Extractive separations offer potential for significant cost reductions through process intensification.
- Insolubility antibodies in organic solvents requires the presence of a selective host.

## Objective/Approach:

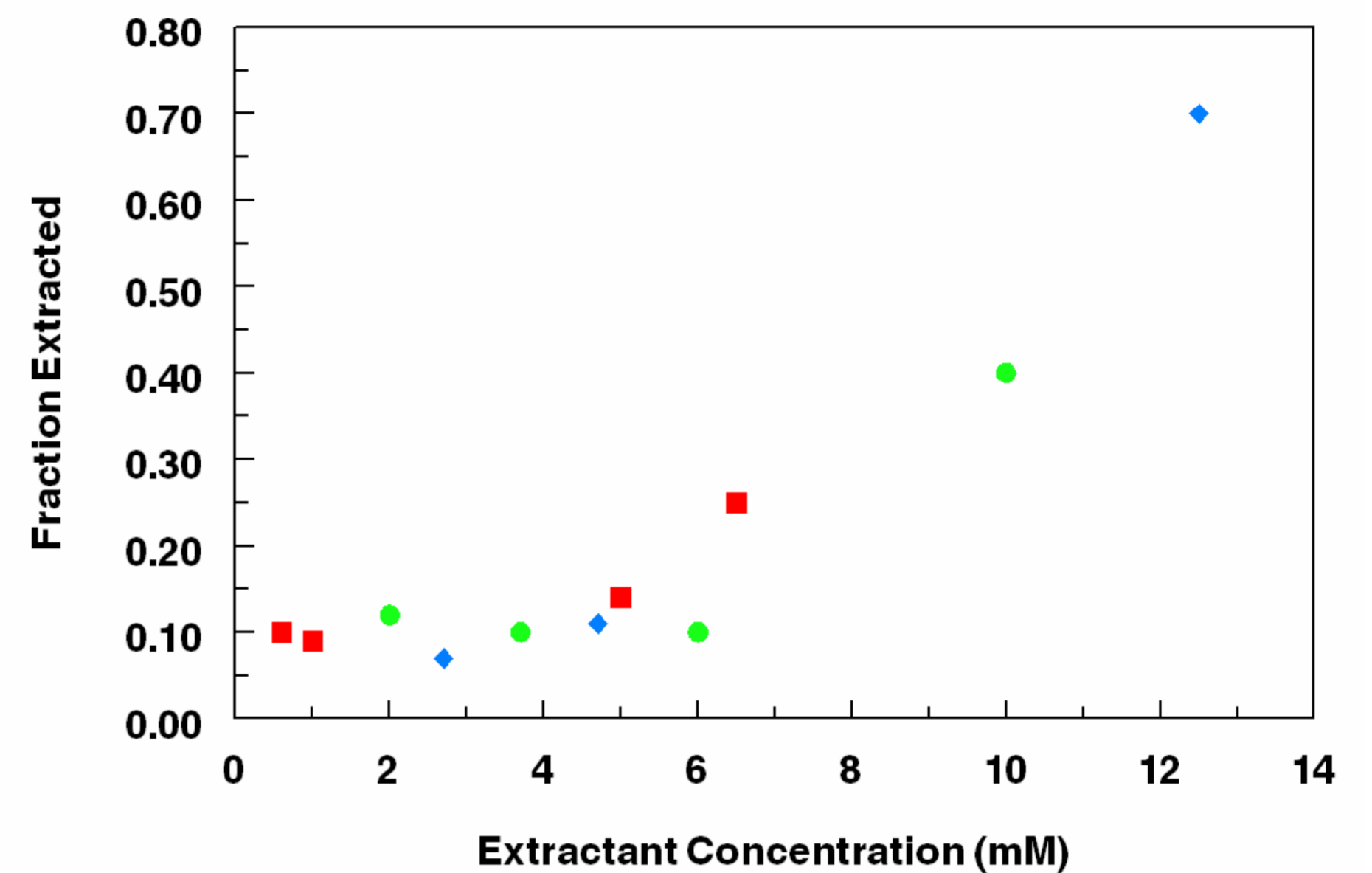
Establish new methodology for immunoglobulin G (IgG) extraction:

- integration of affinity chromatography ligands into selective extractants (hosts) with apolar tails
- Evaluate applicability extractants for IgG extraction

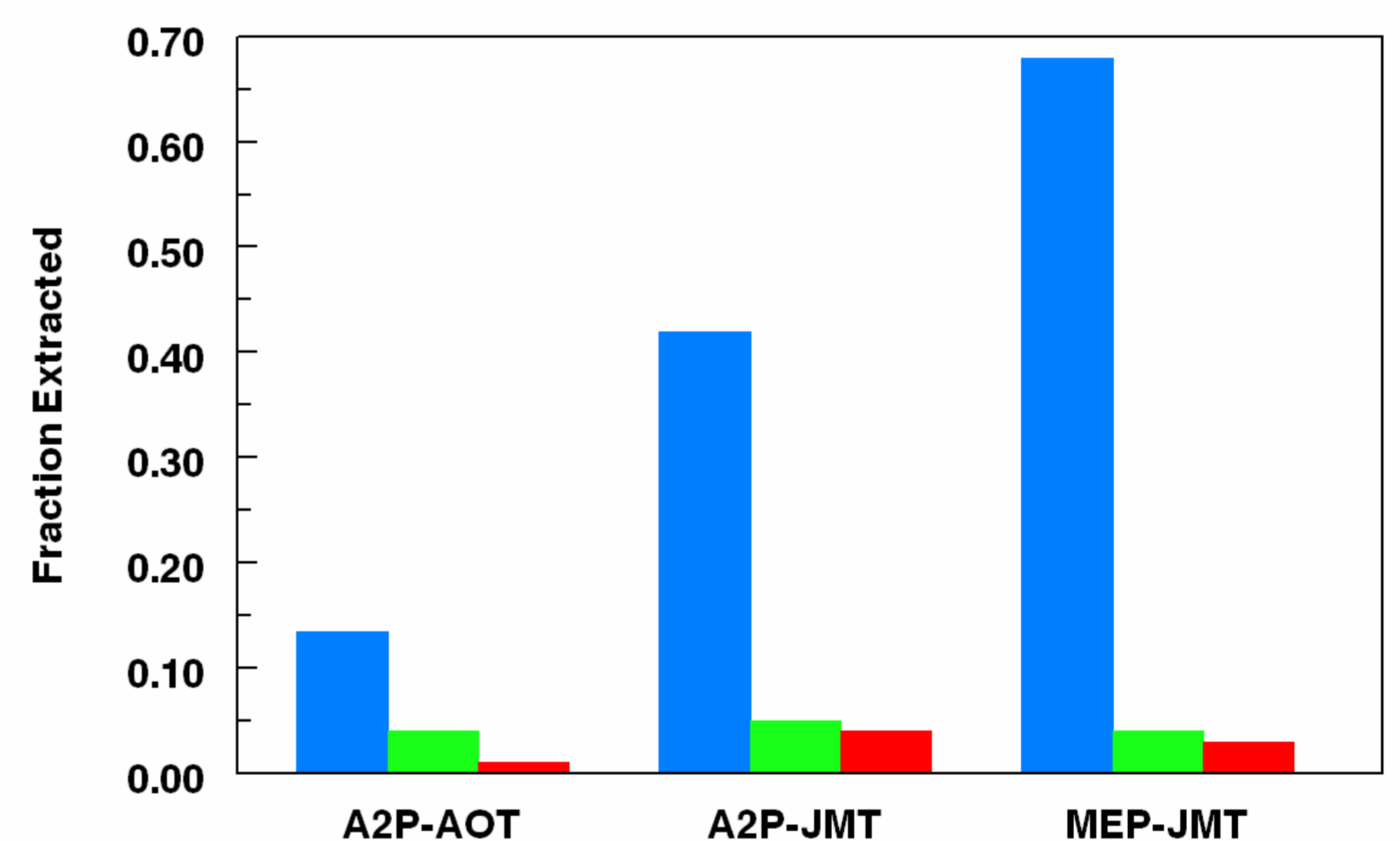


## Results:

- The extractants were synthesized by Syncom, Groningen, The Netherlands
- SDS-page analysis confirmed that denaturation during extraction could be avoided between pH 5 and 11.
- All three extractants are able to extract IgG to a similar extend while showing no affinity towards myoglobin (MYO) and human serum albumin (HSA)
- A minimum “threshold” amount of extractant is required to start solubilization of the IgG.
- In synthetic mixtures the co-extraction of MYO is considerably higher than in single protein solutions
- The IgG extraction from a fermentation derived CHO supernatant (chinese hamster ovary) is considerably lower, which is likely due to competition of the extractants with other proteins.



A2P-AOT (■), A2P-JMT (●), MEP-JMT (◆) pH=5.9-6.5. [IgG]<sub>initial</sub> 0.2 g/l  
Influence of the extractant concentration on the fraction of IgG extracted



Fraction IgG extracted from pure solution (■), mixture with MYO (■), CHO supernatant (■).  
[A2P-AOT] : 5 mM, [A2P-JMT] and [MEP-JMT]: 10 mM. [IgG]: 0.1 g/l. pH: 5–7

## Conclusions:

- Novel affinity extractants for IgG were obtained by combining chromatography affinity ligands with apolar tails.
- The synthesized A2P and MEP ligand containing extractants displayed up to 70% extraction of IgG, while no affinity for proteins such as myoglobin or human serum albumin was observed.
- In mixtures, competitive interactions with other proteins resulted in a decreased selectivity and decreased IgG extraction.