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## Solving of the structural heterogeneity of human catalytic antibody light chains and the role of the constant domain

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Issue on the structural diversity (heterogeneity) of the molecule has been focused along with the development of recombinant antibody drugs. The structural diversity provides some (or many) isoforms of an antibody caused by different charges, different molecular sizes and/or modifications of amino acid residues. For practical use, the antibody and/or the subunits must have a defined structure. A whole antibody is consisted of the light and heavy chain. Once they are separated, the structure of the light or heavy chain becomes very flexible, which also causes the structural diversity and then gives some kinds of isoforms of different pI. We prepared several human antibody light chains possessing a C-terminal histidine-tag, which was expressed in *E. coli*. After Ni-NTA chromatography, the purified light chain was subjected to the cation-exchange chromatography, where several peaks consisted of the monomers and/or dimers were observed at the different retention time. This suggests that the different forms in both molecular sizes and the electrical charges co-exist in the solution, while only a light chain is present. This was the similar results regarding molecular heterogeneity as those observed in recombinant antibody drugs as reported. Several metal ions were examined to investigate the effect on the structural heterogeneity (diversity). Note that copper ion exhibited huge effect for solving the heterogeneity (diversity) issue. In the presentation, the role of the constant domain will be also introduced in detail.

### Biography

Taizo Uda has obtained his PhD from Kyushu University and Postdoctoral studies from Wisconsin University-Milwaukee. He has studied on heterogeneous catalysis and antibody engineering. He was the Director of Diagnostic Group of a Research Institute in a Chemical Company. He is a Visiting Professor at Oita University and Kyushu University. He has published more than 50 papers in reputed journals.

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