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NMR structural studies on Human CD99 Type I

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Human CD99 is a ubiquitous 32-kDa transmembrane protein encoded by the mic2 gene. The major cellular functions of CD99 protein are related to homotypic cell adhension, apoptosis, vesicular protein transport, and differentiation of thymocytes or T cells. Recently it has been reported that expression of a splice variant of CD99 transmembrane protein (Type I and Type II) increases invasive ability of human breast cancer cells. To understand structural basis for cellular functions of CD99 (Type I), we have initiated studies on $hCD99^{TMcytoI}$ and $hCD99^{cytoI}$ using circular dichroism (CD) and multi-dimensional NMR spectroscopy. CD spectrum of $hCD99^{TMytoI}$ in the presence of 200mM DPC and CHAPS displayed an existence α-helical conformation. The solution structure of $hCD99^{cytoI}$ determined by NMR is composed of one N-terminal α-helix, αA, two C-terminal short α-helix segments, αB and αC. While αA and αB are connected by the long flexible loop, αB and αC connected by type III β-turn. Although it has been rarely figured out the correlation between structure and functional mechanism of $hCD99^{TMcytoI}$ and $hCD99^{cytoI}$, there is possibility of dimerization or oligomerization. In addition, the feasible mechanism of $hCD99^{cytoI}$ is that it could have intramolecular interaction between the N- and C- terminal domain through large flexible AB loop.