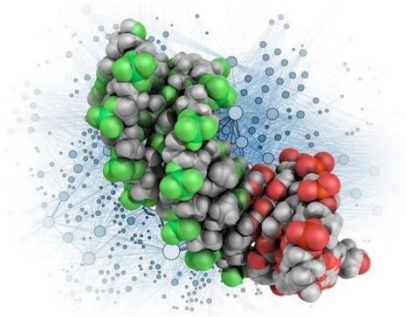

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Structural mechanism of HER2-antibodies complexes by molecular dynamics studies

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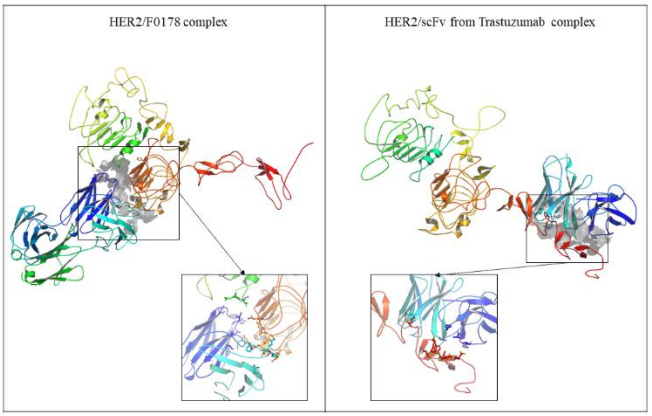
Graphical Abstract *(mandatory)*



Abstract.

Human Epidermal Growth Factor Receptor 2 (HER2) is, among EGFR family, one of the most relevant members as it remains overexpressed on tumor cells and provides resistance to well-studied anti-HER2 monoclonal antibody, Trastuzumab (Herceptin®), or tyrosine kinase inhibitor [1]. Furthermore, HER2 plays a key role in the HER family due the interaction with other HER receptors via a complex signaling network to regulate cell growth, differentiation and survival [2]. In this work, we have employed computational modelling and Molecular Dynamic (MD) simulations to attain a deeper

	understanding of the interaction of specific anti-HER2 antibodies and HER2. The dynamic behavior of HER2 receptor in complex with F0178 and scFv from Trastuzumab was investigated by two replicas of 0.5 μs MD simulations for each system as well as for the individual ones. A variety of structural, energetic and dynamic characteristics ranging from pairwise interactions formation to covariance analyses were performed to the 2 bundle complexes. Our aim was to understand the all-atom details of these intermolecular couplings, fundamental for the development of new therapies.

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