Title (en)

CHEMICAL ACTIVATION MEDIATED BY THE TRANSFER OF FLUORESCENT ENERGY FOR ELUCIDATING THE 3-D STRUCTURE OF BIOLOGICAL MACROMOLECULES

Title (de)

FLUORESZENZ-ENERGIE-TRANSFER FÜR DIE AUFKLÄRUNG DER 3D-STRUKTUR VON BIOMAKROMOLEKÜLEN

Title (fr)

ACTIVATION CHIMIQUE INDUITE PAR TRANSFERT D'ENERGIE DE FLUORESCENCE (FETMA) POUR L'EXPLORATION DE LA STRUCTURE TRIDIMENSIONNELLE DE BIOMACROMOLECULES

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Application

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Abstract (en)

[origin: WO9941607A2] The invention relates to a method for the targeted chemical activation of photoactivatable cross-linking molecules around ligand binding pockets and fluorescent groups in macromolecules, especially biological macromolecules, by using fluorescent ligands or fluorescent groups of the macromolecule, and by selecting photoactivatable cross-linking molecules with specific activation energies, to achieve a radiation-free energy transfer (Forster transfer) from the fluorescent ligands or groups to the cross-linking molecules activated thereby. The invention also relates to a method for elucidating the 3-D structure of macromolecules (M), characterized in that a ligand (F) capable of fluorescence with a fluorescence frequency in the range (1 to (2 is introduced into the macromolecule (M) or its physical position to the macromolecule (M) is determined using known methods; one or more photoactivatable bifunctional cross-linking agents (C) with a corresponding excitation frequency in the range of (1 to (2) are bound in a covalent manner between the non-photoactivatable end (S) of the cross-linking agents (C, C', C") and suitable functional groups (m) of the macromolecule (M) in the absence of light; the macromolecule (M) is irradiated above the frequency interval (1 to (2 at a frequency (Q, and by means of a radiation-free transfer (Forster transfer) to neighbouring cross-linking agents (C and/or C"), the photoactivatable end (A and/or A') of the cross-linking element (C and/or C") is activated for reaction with the surface of the macromolecule (M) and reacted with the surface of said macromolecule (M) in accordance with the distance of the ligand (F) capable of fluorescence; the groups linked in pairs are identified using bioanalytical methods, especially specific digestion of the macromolecule (M), the digested fragments are divided, especially by mass, and physical proximities are determined by calculation.

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