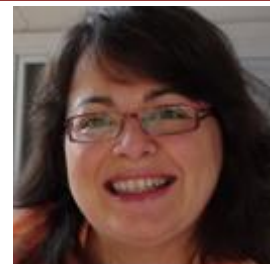




ΤΜΗΜΑ ΧΗΜΕΙΑΣ

ΔΙΑΛΕΞΕΙΣ ΔΠΜΣ "ΧΗΜΙΚΗ ΒΙΟΛΟΓΙΑ" 2015-2016 ΣΤΟ ΠΛΑΙΣΙΟ ΤΟΥ ΜΑΘΗΜΑΤΟΣ 'ΕΡΕΥΝΗΤΙΚΗ ΜΕΘΟΔΟΛΟΓΙΑ'

ΟΜΙΛΗΤΗΣ: *Assoc. Prof. Konstantina Fylaktakidou*
Laboratory of Organic, Bioorganic &
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Department of Molecular Biology &
Genetics



**DEMOCRITUS UNIVERSITY OF
THRACE**

ΘΕΜΑ: *Small Organic Molecules with DNA Photo-Cleaving
Activity. David against Goliath*

Τόπος: *Αίθουσα ΧΒ3*
(Ισόγειο Βορείου Κτηρίου Τμήματος Χημείας)
Ημερομηνία: *Τετάρτη, 23 Μαρτίου 2016*
Ωρα: *11:00 - 13:00*

Περίληψη

Synthesis and development of small organic molecules that selectively cleave DNA upon irradiation with visible or UV light represents a field of research with applications in biotechnology, gene therapy, and molecular diagnostics. In medicine, the ability of these chemical systems to generate reactive organic intermediates "on demand", in both spatial and temporal sense, represents a promising approach to new antitumor therapeutic strategies. Additionally, due to emergence of antibiotic resistance among pathogenic bacteria, a bacterial photodynamic inactivation is also considerably influenced by the technique. The key step in our approach is the generation of reactive radical species via the homolysis of an N-O bond. Besides carbonyloxyl, novel application of sulfonyloxyl, carbamoyloxyl, oxycarbonyloxyl, aminyl and amidinyl radicals in DNA photo-cleavage has been performed by our group. These radicals abstract hydrogen atoms from the DNA backbone causing significant DNA single and double strand cleavages. Moreover, the reaction's independence of oxygen and pH, as well as the residual photo-base or photo-acid generated moieties may proved to be important in the therapy of solid tumors and may have multiple biotechnological applications in micro-patterning of biomolecules on photoresists for the synthesis of biochips.