UCF Biophysics Group Seminar

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Crosstalk between microRNAs and metabolic pathways in cancer treatment

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ABSTRACT

Recently it has become clear that certain tumor cells adapt tolerance strategies for initial survival from anticancer treatment. These non-mutational tolerant cells precede and promote eventual drug resistance by acquiring new mutations. In the deadliest cancer, non-small cell lung cancer (NSCLC), it has been found that $EGFR^{T790M}$-positive drug-resistant cells are derived from $EGFR^{T790M}$-negative drug-tolerant cells that survive initial treatment with first-generation EGFR tyrosine kinase inhibitors (TKIs). Although a third-generation EGFR-TKI (osimertinib) targeting *T790M* resistance mutations has been applied in the clinic most recently, few therapeutic strategies targeting osimertinib-tolerance are applied in a clinic. Our study reveals that NSCLC cells adopt a tolerance strategy to defend against EGFR inhibition by microRNA-dependent dysregulation of metabolic pathways. In addition, we will discuss the activity of both the passenger and guide strands of the miRNA in diseases. Our study challenges the conventional concept of "only one strand is active" and will expand our knowledge of the roles of passenger strands of many other miRNAs in diseases.