Z. ZHAO, X. TAO, Y. XIE, Q. LAI, W. LIN, K. LU, J. WANG, W. XIA*, Z.-W. MAO* (SUN YAT-SEN UNIVERSITY, GUANGZHOU, P. R. OF CHINA)

In Situ Prodrug Activation by an Affibody-Ruthenium Catalyst Hybrid for HER2-Targeted Chemotherapy
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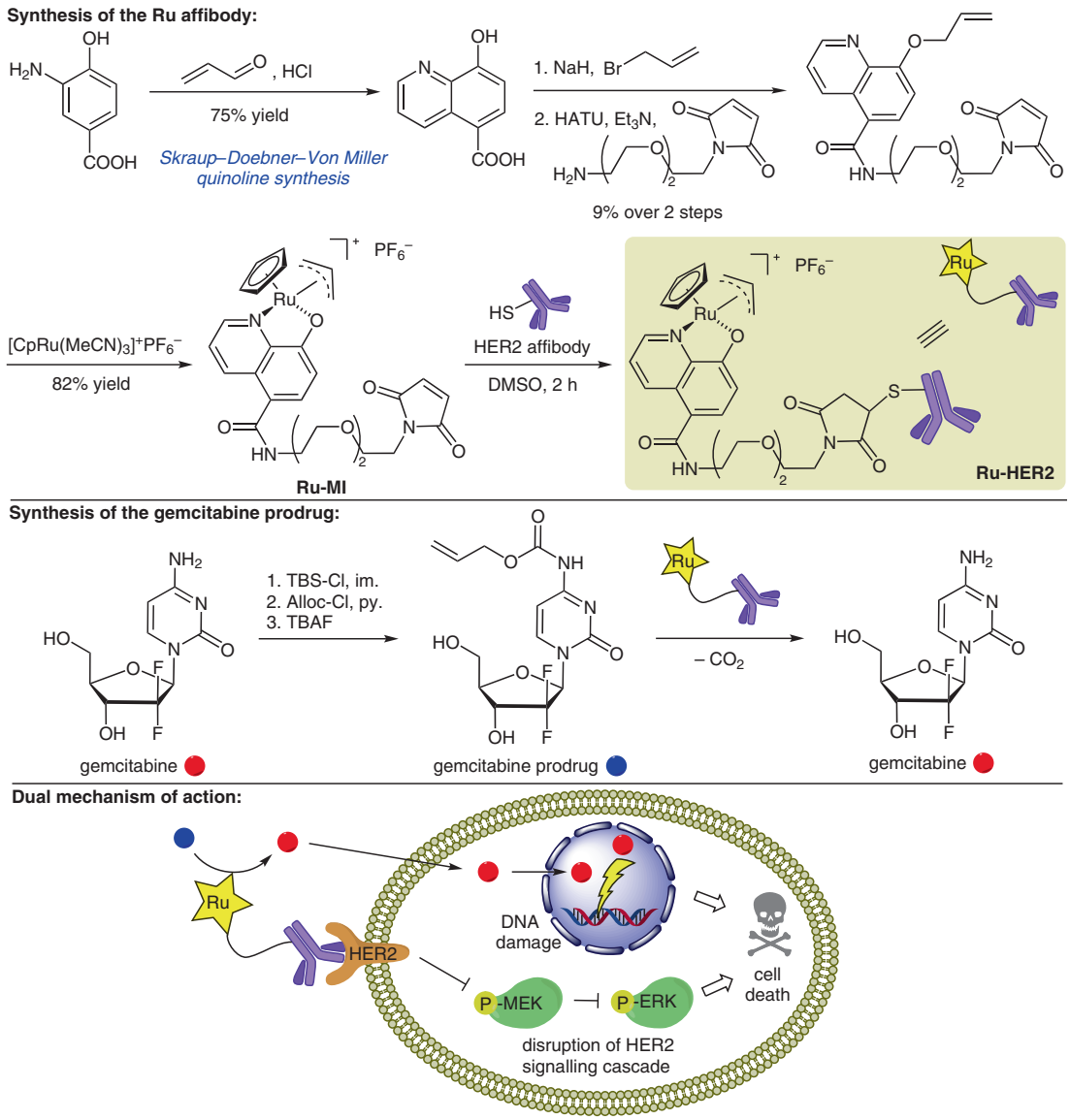
Targeted Chemotherapy Using in Vivo Transition Metal Catalysis



Significance: The human epidermal growth factor receptor 2 (HER2) is overexpressed in many cancer cell lines. The authors developed a ruthenium-containing affibody, **Ru-HER2**, with a dual mechanism of action. It selectively binds and blocks HER2, and locally activates a gemcitabine prodrug, resulting in high anticancer activities with reduced cytotoxicity for healthy cells.

Comment: The ruthenium-containing intermediate **Ru-MI** was coupled to a HER2 affibody in a 1:1 ratio using maleimide thiol chemistry. This construct was capable of uncaging allyloxy carbamate-protected gemcitabine in vitro and in vivo. The selective and controlled introduction of DNA damage caused by the uncaged gemcitabine in cancer cells opens a new strategy for catalytic chemotherapy.

SYNFACTS Contributors: Dirk Trauner, Klaus-Peter Ruehmann
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Synfact of the Month