[J. Biol. Chem., 276, 2686-2692 (2001)]

Blockade of the Extracellular Signal-regulated Kinase Pathway Induces Marked G1 Cell Cycle Arrest and Apoptosis in Tumor Cells in Which the Pathway Is Constitutively Activated.
Rika HOSHINO, Susumu TANIMURA, Kazushi WATANABE, Tadashi KATAOKA* and Michiaki KOHNO

Constitutive activation of the ERK pathway is associated with the neoplastic phenotype of a relatively large number of human tumor cells. Blockade of the ERK pathway by treatment with PD98059, a specific inhibitor of mitogen-activated protein (MAP) kinase/ERK kinase (MEK), completely suppressed the growth of tumor cells in which the pathway is constitutively activated (RPMI-SE and HT11080 cells). Consistent with its prominent anti-proliferative effect, PD98059 induced a remarkable G1 cell cycle arrest, followed by a modest apoptotic response, in these tumor cells. Selective up-regulation of p27Kip1 was observed after PD98059 treatment of RPMI-SE and HT11080 cells.


Shin-ichi WATANABE, Keiichiro YAMAMOTO, Yukiko ITAGAKI, Tatsunori IWAMURA, Tetsuo IWAMA, Tadashi KATAOKA,* Genzoh TANABE and Osamu MURAOKA

The treatment of alkynylselenonium salt with benzenesulfonic acid in i-PrOH gives (Z)-β-sulfonylvinylselenonium salts in good yields. The alkynylselenonium salts thus prepared react with nucleophiles such as alkoxides, halides, and acetylides to produce β-functionalized (Z)-vinyl sulfones in high yields. Furthermore, we succeeded in the simple stereoselective one-step synthesis of various chiral (Z)-β-alkoxyvinyl sulfones by the use of chiral alcohols. These reactions proceed with retention of configuration via the selenurane intermediates or through a pathway of addition-elimination.


Synthesis and Structure of 1-Methyl-2,6-bis(electron-withdrawing group)-Substituted Selenabenzenes.
Eiji HONDA, Tatsunori IWAMURA, Shin-ichi WATANABE, Tadashi KATAOKA*, Osamu MURAOKA and Genzoh TANABE

Selenabenzenes with two electron-withdrawing groups (EWGs) at the 2- and 6-positions were synthesized from α,ω-dihalides via seven steps and isolated as stable compounds at room temperature. According to X-ray structural analysis of the dibenzoyl derivative, the six-membered ring containing a selenium atom is almost planar and the structure of the selenium atom is tetrahedral with four sp³ hybridized orbitals. Structures of isomers of selenanes and Se-methylselenium salts were discussed based on their ¹H- and ¹³C-NMR spectral data.

[Tetrahedron, 57, 8455-8462 (2001)]

Dimethyl Sulfide-Boron Trihalide-Mediated Reactions of α,β-Unsaturated Ketones with Aldehydes:
One-pot Synthesis of Baylis-Hillman Adducts and α-Halomethyl Enones
Tatsunori IWAMURA, Masaru FUJITA, Tetsuya KAWAKITA, Sayaka KINOSHITA, Shin-ichi WATANABE and Tadashi KATAOKA*

The reactions of aldehydes with 3-buten-2-one were conducted in the presence of BBr₃·Me₂S or BCl₃·Me₂S and then worked up with aqueous NaHCO₃, affording the α-methylene aldol 1, α-halomethyl aldol 2 or 4, and α-halomethyl enones 3 or 5, respectively. In contrast, reactions quenched with water gave the α-halomethyl enones 3 or 5 in high yields, while the work-up with an aqueous 10% trimethylamine gave the α-methylene aldol 1. The benzilphenol 6 and half-acetal 7 were obtained from the reaction of p-nitrobenzaldehyde with cyclohexenone after work-up of the reaction mixture with water.