Reactivity of Tetracyclic Iminium Salts of the Benzo[*f*]pyrido[2,1-*a*]-isoindole and Azepino[2,1-*a*]benzo[*f*]isoindole Type, with a Preliminary Analysis of their Interactions with Nucleic Acids*

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Hydride reduction of the tetracyclic isoindolium salt derivatives **2a – c** yields the neutral isoindole derivatives 9-chloro-1,2,3,4,6,6a,7,12b-octahydrobenzo[*f*]pyrido[2,1-*a*]isoindole (**3a**), 4,4a,5,7,8,9,10,10a-octahydropyrido[2,1-a]thieno[3,2-f]isoindole (**3b**), and 10-chloro-2,3,4,5,7,7a,8,13b-octahydro-1*H*-azepino[*f*]pyrido[2,1-*a*]isoindole (**3c**). Oxidation of **3a** with selenium dioxide is accompanied by a ring transformation and yields 8-chloro-5,5a,6,12-tetrahydrobenzo[*g*]pyrrolo[1,2-*b*]isoquinolin-12-one (**4**). Deprotonation of isoindolium salt derivatives **2a**,**c**,**d** yields cyclic enamines which undergo ring expansion with dimethyl acetylenedicarboxylate resulting in compounds with the 4,5,6,8,8a,9-hexahydroazocino[2,1-*a*]benzo[*f*]isoindole (**6a**), 4,6,7,9,9a,10-hexahydro-5*H*-azonino[2,1-*a*]benzo[*f*]isoindole (**6c**) and 4a,5,7,8,9,10-hexahydro-4*H*-azonino[2,1-*a*]thieno[3,2-*f*]isoindole (**6d**) skeleton. Interactions of **2** with double-stranded nucleic acids are characterized by relatively large NMR upfield shifts (0.25 ppm) and signal broadening (by about 45 Hz) of aromatic ligand signals, indicating at least partial stacking with nucleobases. Rather small effects are observed, however, in melting point and viscosity increase with double strands; this is tentatively ascribed to competitive interactions with unfolded polymer parts.

Key words: Azaheterocycles, Iminium Salts, Enamines, Isoindole Derivatives, DNA Binding