Multiuser MIMO (MU-MIMO) in general, and block diagonalization (BD) in particular, are playing a prominent role toward the achievement of higher spectral efficiencies in modern OFDMA-based wireless networks. The utilization of such techniques necessarily has implications in the scheduling and resource allocation processes taking care of assigning subcarriers, power, and transmission modes to the different users. In this paper, a framework for channel- and queue-aware scheduling and resource allocation for BD-based MU-MIMO-OFDMA wireless networks is introduced. In particular, using an SNR-based abstraction of the physical layer, the proposed design is able to cater for different BD-MU-MIMO processing schemes [co-ordinated Tx-Rx (CTR) or receive antenna selection (RAS)], uniform or adaptive power allocation (UPA/APA), continuous or discrete rate allocation (CRA/DRA), and many different scheduling rules. Additionally, the different strategies are complemented by a new greedy user/stream selection algorithm that is shown to perform very close to the optimal user/stream selection policy at a much lower complexity. Results using system parameters typically found in 4G networks reveal that, in most cases, low-complexity solutions (RAS-, UPA-based) achieve a performance close to the one attained by their more complex counterparts (CTR-, APA-based).