

# International kidney exchange games \*

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We introduce generalized matching games, defined by a graph  $G = (V, E)$  with an edge weighting  $w$  and a partition  $V = V_1 \cup \dots \cup V_n$  of  $V$ . The player set is  $N = \{1, \dots, n\}$ , and player  $p \in N$  owns the vertices in  $V_p$ . The value  $v(S)$  of coalition  $S \subseteq N$  is the maximum weight of a matching in the subgraph of  $G$  induced by the vertices owned by players in  $S$ . If  $|V_p| = 1$  for every player  $p$  we obtain a classical matching game. We prove that, contrary to the case of matching games, checking core non-emptiness is NP-hard and use our reduction to settle the complexity classification on the core of  $b$ -matching games. We propose generalized matching games as a suitable model for international kidney exchange programs, where the vertices in  $V$  correspond to patient-donor pairs and each  $V_p$  represents one country and prove a number of complexity results.

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