ALADAR HEPPES, Eotvos, Budapest, Hungary
Near-transversal lines in families of congruent circles

Let F be a family of congruent circles. We say that F has property $T(3)$ if every triple of its members has a line transversal. In 1980, Katchalski and Lewis proved the existence of a constant m such that in every $T(3)$-family of disjoint congruent discs there is a line intersecting all but at most m of the discs. A family of congruent circles of unit diameter is said to be t-disjoint if the distance of every pair of the circles is larger than t. We have two generalizations of the above mentioned Katchalski–Lewis theorem:

(1) The theorem holds with the conjectured $m = 2$.

(2) The theorem holds for t-disjoint families as well: To every $t > 0$ there exists a constant $m(t)$ such that in every $T(3)$-family of t-disjoint congruent discs there is a line intersecting all but at most $m(t)$ of the discs.