Microarrays for the screening of allergen-specific IgE in human serum.

The described in vitro test system for allergy diagnosis is based on microscope glass slides activated with (3-glycidyloxypropyl)trimethoxysilane. Allergen solutions are immobilized as small droplets (approximately 10 nL) on the activated glass slides with a piezoelectric arrayer. In contrast to other tests for specific IgE, such as Pharmacia CAP FEIA, AlaSTAT, or FAST, only a 25-microL serum sample is needed for the screening of allergen-specific IgE against a multitude of allergens and the test can be performed in less than 1 h. Compared with multiallergen dipstick screening tests (e.g., IgEquick, CMG Immunodot) based on multiallergen-coated nitrocellulose strips, the measurement of the microarray-based system can be performed automatically. The chemiluminescence intensities are detected with a sensitive CCD camera. Allergen extracts and recombinant/purified allergens (24 preparations) have been used on the same modified surface for the screening of allergen-specific IgE. With these disposable microarray slides, it is possible to distinguish between patients with and without elevated levels of allergen-specific IgE. Repeated measurements of serum samples demonstrated a sufficient reproducibility. Detection limits (microg/L) of 0.35 (r Betvl), 0.16 (PLA2), and 1.9 (Der p1) were achieved.