aminonaphthol ether sulfate isolated from the urine. Wiley suggested that possibly other portions of the aromatic amine might be eliminated in conjugation with mercapturic acid. The carcinogenic azo-dyes seem to undergo a different type of metabolic degradation. Ortho-amino-azo-toluene first is reduced in part in the azo-position to p-toluylenediamine, which is excreted after acetylization as diacetyl-p-toluylenediamine (Hashimoto). The experiments of Yamazaki and Sato, if confirmed, on the other hand, would indicate that the aromatic amine (intermediate) as well as the azo-dye are capable of eliciting neoplastic responses by a direct action upon the bladder mucosa.

Mayer suggested that possibly hypersensitivity is involved in the causation of aniline tumors. In support of this hypothesis he pointed out that some of the related aromatic amines (para-phenylenediamine and other ursol compounds) are responsible for the frequent occurrence of occupational dermatitis, asthma and rhinitis on an allergic basis among fur dyers. The supposition is that some of the conversion products formed in the body from the carcinogenic aromatic amines are chemically highly reactive quinogenic substances which can combine easily with protein complexes and thus form chemospecific antigens. Hueper (1936), and Hueper, Briggs and Wolfe have dealt recently with this aspect of the causative mechanism of aniline tumors in two communications which discuss the chemo-immunologic and histologic evidence which seems to favor such a conception (Landsteiner; Marrack; Klopstock and Selter; Boyland and Warren; Creech and Franks; Reuterwall; and others). Attention may also be called to a paper of T. Bauer on the serum antibodies against various endocrine and other organic substances containing phenol groups, as the antibodies produced showed chemospecific qualities in the presence of the phenol group and thereby demonstrated the possibility that similar systemic immune reactions may follow the introduction of aromatic amines.

According to the present conceptions of the causative mechanism of allergy, it appears necessary to assume that these chemicals first combine in the body with proteins, thereby forming antigens, of which the aromatic amine is the hapten, before histogenic sensitization can occur. The investigations on the chemical constitutional specificity of immune bodies by Landsteiner and coworkers, Klopstock and Selter, Marrack, and others, have thrown some light on the chemical structure and biologic qualities of such compounds.

Landsteiner succeeded, by diazotization of various aromatic amines (aniline, etc.) and by coupling the resulting diazo product with protein, forming "azo-proteins", in obtaining substances capable of antibody production of specific nature. Precipitin and complement fixation reactions performed with these azo-proteins and their antisera proved to be specific for the aromatic group, while the protein component had lost its species specificity through the coupling process and did not react. It was therefore possible to use homologous protein in the preparation of the azo-protein and still obtain an antiserum.