A Development of Antitumor Polysaccharides from Mushroom Fungi

Takashi Mizuno
Shizuoka University
4-13-9, Seinan-cho, Fujieda-shi, Shizuoka 426, Japan

Summary
It has been known for many years that most fungi which have known effects against cancers of the stomach, esophagus, lungs, etc., belong to the Polyporacea. However, the components responsible for such action have not been clearly defined. In Japan, in 1968, it was reported that a hot water extract from some edible mushrooms belonging to the Polyporacea, showed a marked host-mediated antitumor activity. Since then, numerous researchers have isolated active polysaccharides and have identified them to be \((1 \rightarrow 3)-\beta-D\)-glucopyranans with a \((1 \rightarrow 6)-\beta-D\)-glycosyl branch containing protein.

Several antitumor polysaccharides, some hetero-\(\beta\)-glucans and their protein complexes such as xyloglucans, and acidic \(\beta\)-glucan containing uronic acid, were isolated from the extracts of using large amounts of dilute alkali, in Japanese mushrooms (8 species) and Chinese mushrooms (5 species). Several trials have been made to enhance activity by chemical modification such as polyalcohols formed by a mild Smith degradation and the products formed by BH\(_4\)-reduction after IO\(_4\)-oxidation. Mushroom polysaccharides are considered to be biological response modifiers (BRM) or immunopotentiators because of their action mechanism. In Japan, three different polysaccharide antitumor agents have been developed from the fruiting body, mycelium, and culture medium, from three mushroom species.