Mucosin and Mucoitin, Preliminary Note

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Investigating the structure of mucoitin (hyaluronic acid), Jeanloz¹⁾ and Kurt H. Meyer²⁾ agreed with respect to the position in the glucuronic-acid-esters, wherewith acetylglucosamine links glucosidically, whereas the former author claimed the position in acetylglucosamine glucosidically bound by glucuronic acid to be 3-C and the latter 4-C. (The authors reasoned or assumed a pyranose structure of the monosaccharide components.)

To begin with, the writers treated acetylmucosin-methylester (crystalline)³⁾ with periodic acid under the conditions preferred by Yosizawa.⁴⁾ The compound consumed 2.96 moles of the oxidant per mole, releasing 0.93 mole of formaldehyde (separated as the dimedon derivative),⁵⁾ which suggested (I) and (II) as possible structures of mucosin.

β -Glucuronide structure has been established.⁶⁾

Next pure mucoitin (from human umbilical cords; m.w. some 9300 from iodine use) was oxidized similar to above. It used 3 moles of the oxidant per mole, namely, the extremities of its chain reacted with the agent but not the internal part. Hence, a pyranose structure must be assigned to glucosamine units in mucoitin, because acetylglucosamine in the internal part of mucoitin, if it be a furanose, would use 1 mole of periodic acid per unit. Mucoitin is expressed in the formula below (III), if it is assumed that glucuronic acid units also possess a pyranose structure.

β -Glucosaminide structure is arbitrary.

References

- 1) Jeanloz, *Experientia*, 1950, **6**, 52; Jeanloz and Forchielli, *J. Biol. Chem.*, 1951, **190**, 537.
- 2) Meyer, Kurt H. and Fellig, *Experientia*, 1950, **6**, 186.
- 3) Isikawa, *Tohoku J. Exp. Med.*, 1951, **54**, 197.
- 4) Yosizawa, *ibid.*, 1950, **52**, 111.
- 5) As regards the determination procedure, see Masamune and Yosizawa, *ibid.*, this volume, p. 43.
- 6) Isikawa *ibid.*, this volume, p. 23.