Identifying Pollen Cells Using Computer Analysis: An Aid for Allergists, Immunologists, and Other Health Care Specialists

Staszewski, Adam

This project was to create a program that would analyze digital images of pollen cells and quickly identify them. A digital library of images was created of the pollen grains then each image was labeled and classified accordingly within the computers memory. An image was recorded of the pollen sample. An unknown pollen sample could be submitted on a glass slide to a Health Care Specialist. It would then be cross referenced with the digital library and would present the patient/specialist with a brief summary of the grains nature and the degree of expected allergic reaction. This program could be used as an aid for allergists, immunologists, and other health care specialists in recommending possible treatment and precautions. This program was created with an edited version of C++. It also has a second editable copy should the need arise to add more grains of pollen into the system for further more in depth analysis. The program uses custom transformed algorithms to identify the pollen grains by moving them into appropriate recognition fields. It then identifies common characteristics within the pollen cells and creates a percentage of similarities between the unknown pollen cells and the images in the digital library. Finally, it analyzes the similarities and outputs the type of pollen grain (by name) along with pharmaceutical recommendations for treatments that neutralize the reactions of these pollen grains. In addition, possible adverse side effects to the medications are identified.

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