# PREFACE

The diagnosis of malaria by microscopy is an art, and a difficult one. Instructional materials such as stained microscope slides, printed and projected images are usually limited to showing ideal parasites that are seldom seen in practice. Students may become frustrated when they are unable to find parasites that resemble the text-book presentations.

This instructional and reference course was designed to provide views of parasites that approximate those seen by routine microscopy in laboratories in endemic areas where facilities for slide preparation may not be adequate. In the first field trial of the module, students remarked that the images in the module were exactly what they saw on their slides in their laboratories. This was what we had hoped to hear.

The image library consists of about 1000 digital images from thin and thick blood smears on slides collected from several African countries, the Middle East, South East Asia, Central America and the Caribbean. There are few perfect parasites or fields, and that is intentional. In practice, the malaria parasites seldom cooperate: their morphology and staining characteristics are infinitely variable. Indeed, finding a perfect parasite with all of the documented characteristics of its species is a rarity and can be a cause for celebration. Expertise in malaria microscopy comes from long practice and experience, and the skill can be quickly lost if not used regularly.

The module also includes images not seen in common laboratory practice and these were included to give a more complete picture of the parasite and its reproductive potential in its insect and mammalian hosts. The image library includes placental smears, rare parasite stages such as gametes and ookinetes in the blood, oocysts and sporozoites in the mosquito, and extraerythrocytic stages in the mammalian liver. There are also images of blood-borne pathogens frequently seen in stained blood films, artifacts that mimic parasites and infected erythrocytes, and films made at necropsy from a fatal case of malaria. There is also a series of slides of *Babesia* species, which closely resembles *Plasmodium falciparum.*

The course is designed for use by an instructor in a classroom setting, for self-instruction, and includes exercises at various levels of difficulty. Answers are provided for all questions in the exercises. The times given for completing each section are suggestions only; each user is expected to study the images at his or her own pace. The course begins at the most elementary level, showing the components of the malaria parasite, the morphology of each stage of the life cycle, and the changes made to the infected host cell, and it attempts to explain some of the irregularities commonly seen in stained slides.

I am indebted to all who enthusiastically and generously contributed to the module by providing slides, images, suggestions, reviews, design, and most of all their time and patience.

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