

PRINCIPLE OF FORMULATION OF CIRCADIAN RELEASE MEDICINES

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Introduction

Rheumatoid arthritis is a chronic disease that causes inflammation of the joints and surrounding tissues. To anticipate morning joint stiffness, chrono-therapeutic systems have been designed that adjust the treatment for 24 hours.

Keywords

Controlled release system, circadian release, prednisolone.

Purpose

Study of the formulation technology of circadian release drugs.

Material and methods

Bibliographic review of journals in the pharmaceutical field listed in electronic databases (Pubmed).



Scopus



Conclusions: Intelligent drug delivery systems, which act depending on the amplitude of circadian physiological and biochemical rhythms, are an important perspective in individualized treatment.

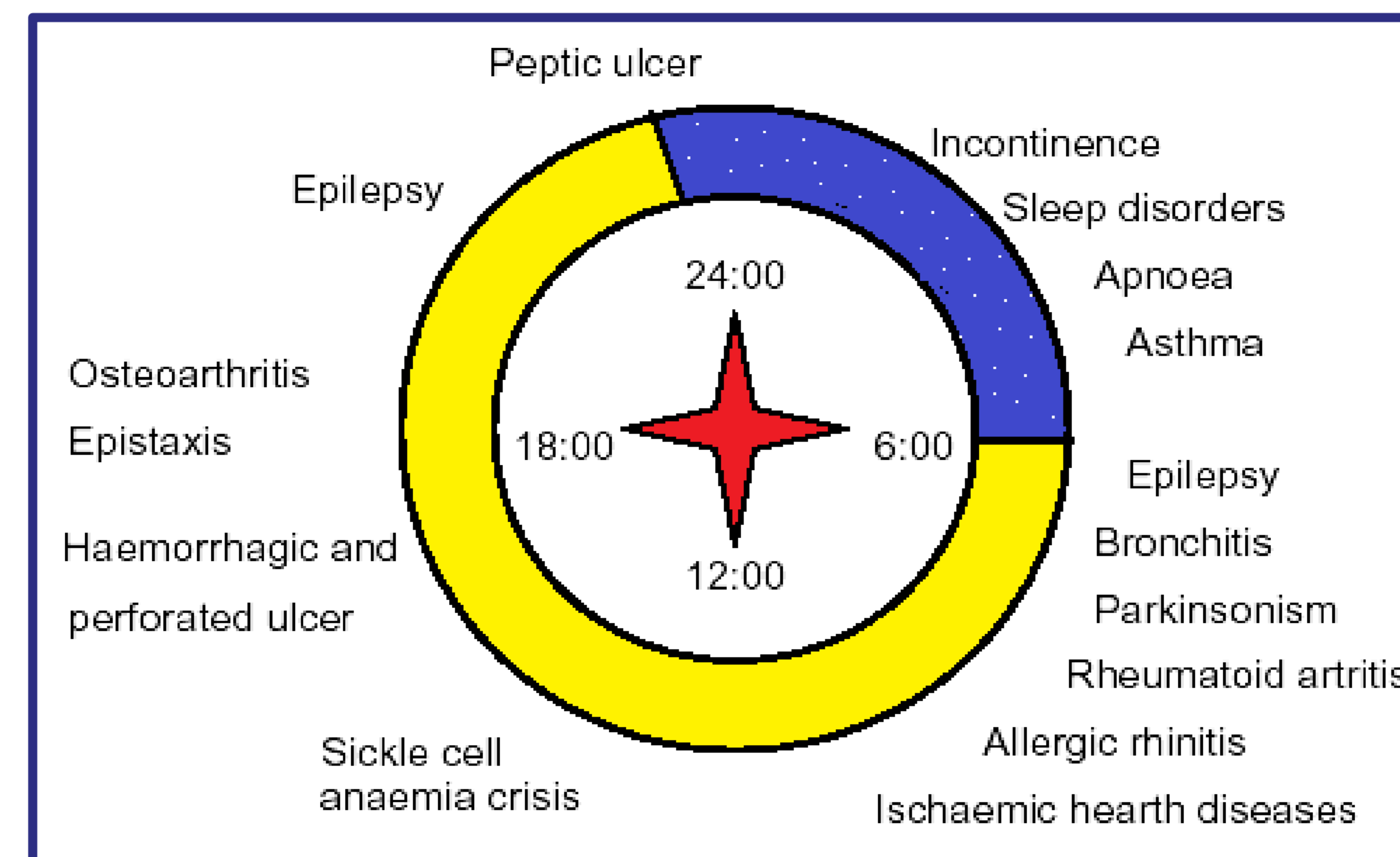


Fig. 1 Cycle of circadian rhythm when symptoms of diseases are the worst (Source: Neeharika et al. J Crit Rev, Vol 2, Issue 4, 31-40)

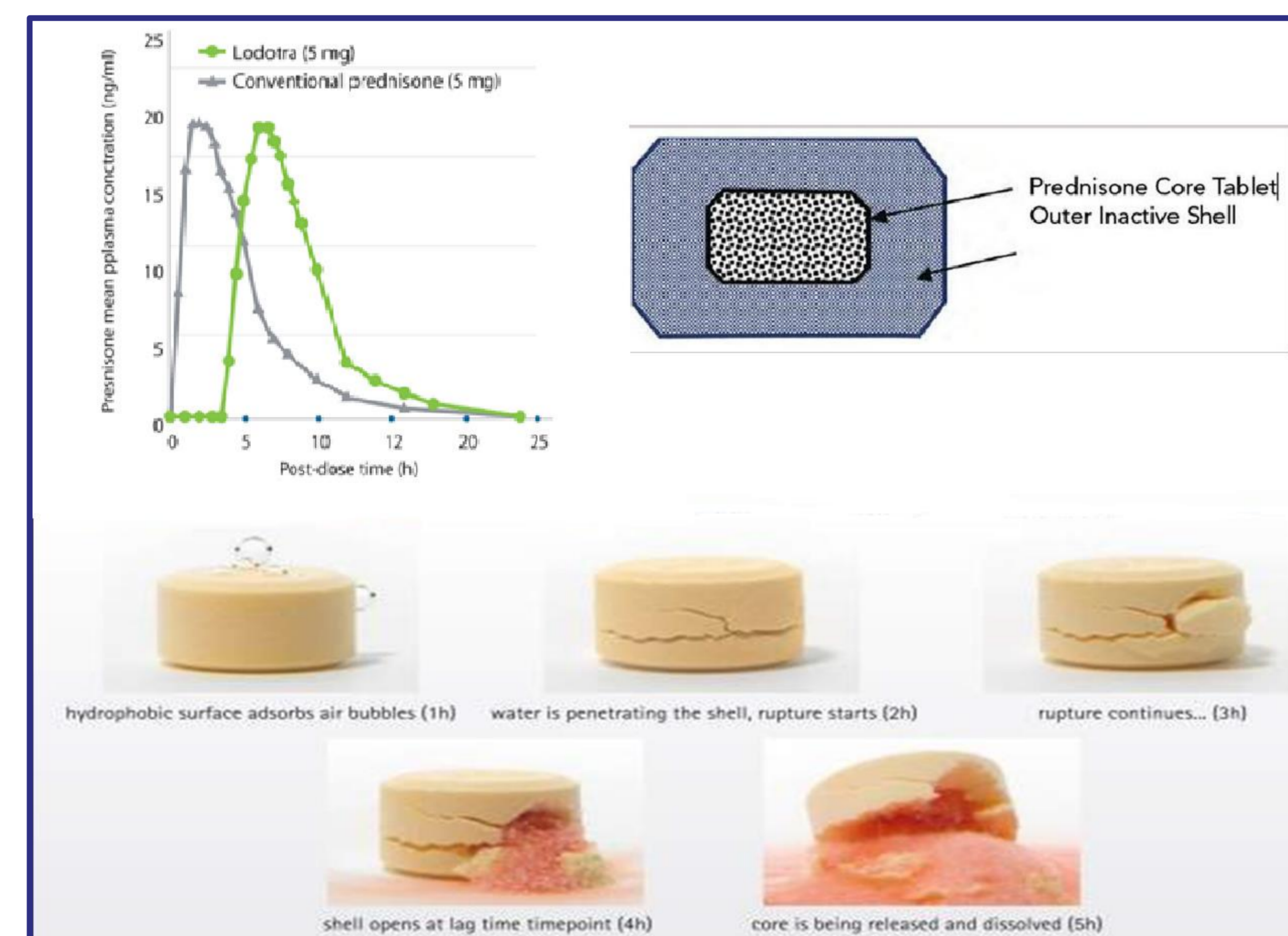


Fig. 2 Lodotra based on GeoClock® technology

(Source: J.M. Packiaraj, et. al. Form. modified-release tab. of Corticosteroid. Indo American Journal of Pharm Research.2013;3(12).

Results

Currently, the trend in the development of controlled release drugs increasingly involves the correlation with chrono-pharmacokinetic parameters (fig.1).

For this purpose, the company "Nitec Pharma", using the technology "Geoclock" SkyePahrma, developed the first chrono-system with prednisolone content. The chrono-system releases the active principle after a well-defined time, called "lag time".

The system for oral administration is a matrix consisting of a compacted core with active substance, lubricants and disintegrants, coated with hydrophobic excipients (wax) independent of pH. The drug is administered before bedtime, after four hours the biological fluids diffuse into the system, causing the expansion of the nucleus and the release of prednisolone, the maximum plasma concentration being reached in 8 hours (fig.2).

Research is currently underway on chrono-preparations for sleep disorders, asthma and high blood pressure.