「睡眠調整に関わる生物時計及び恒常性維持機構の機能評価スキルの開発とその臨床展開」
Evaluation of circadian and homeostatic regulatory function of human sleep and its clinical application

「生物時計，睡眠覚醒，気分調節を結ぶ双方向的な機能ネットワークの分子基盤に関する研究」
Molecular basis of functional network between biological clock, sleep-waking and mood regulation

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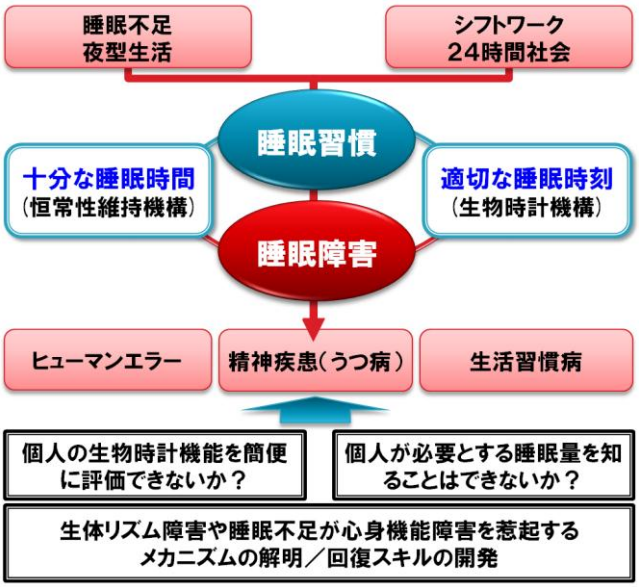
■ 研究内容

24 時間社会は交代勤務，時差飛行，生活の夜型化，短時間睡眠，不規則な食事時刻など私たちの生体リズムを撹乱させる生活要因に満ちあふれており，不眠や覚醒困難，不規則な睡眠リズム，耐え難い眠気など種々の睡眠問題を抱える現代人が激増している。私たちはヒトの睡眠･生物時計機能を簡便に診断するシステムを開発し，睡眠リズム障害に適切に対処することで人々が活力ある生活を送れるようサポートするプログラムの構築を目指す。また，睡眠不足や睡眠リズム異常はうつ病や認知機能障害，生活習慣病のリスクを高めるなど心身の機能に悪影響を及ぼす。そこで，睡眠･生体リズム調節と気分･認知･代謝機能をつなぐ機能的ネットワークを精神生理，神経内分泌，分子生物学的視点から検討し，睡眠･生体リズムを健やかに保つことの生理的意義を解明する。

■ Research works

In our 24-hour society, we are exposed to various circadian disrupting lifestyle factors such as shift works, jet-lag flights, night owl life, or excessive artificial light exposure during night. As a result, an increasing number of people are suffering from persistent sleep problems. Sleep debt and irregularity in modern people also cause adverse effects on our mind and body, e.g., increasing the risk of depression, human error and metabolic syndromes.

In the SRPBS, we investigate the functional linkage between sleep-wake/circadian regulation and mood, alertness, cognition and metabolism/energy expenditure to reveal the physiological meaning of maintaining our sleep habits stable and sufficient. For countermeasure against these sleep problems, we newly develop a diagnostic system of individual's biological clock function by real-time monitoring of clock gene transcription in peripheral cells as an accessible surrogate of master clock in the human brain hypothalamus. We also investigate a technique to estimate individual's sleep need and recovery process from sleep debt. These research tasks evolve into a support program to effectively obtain and maintain vibrant social living by remediating one's inappropriate sleep habits.



図：現代社会の睡眠問題と脳プロ課題
Fig. Sleep problems in modern society and research task of SRPBS.