Biological Clocks - Nobel Prize for Medicine

Why in news?

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- Jeffrey C. Hall, Michael Rosbash & Michael W. Young are to be jointly awarded the 2017 “Nobel Prize for Medicine”.
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- The award is for their work in discovering the mechanisms controlling the internal clocks in living organisms.
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What is their research about?

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- The trio’s work was in ‘Chrono Biology’ – A science that examines periodic phenomena in living organisms in relation to nature.
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- They made significant contributions in unravelling the genetic coding and protein pathways that regulate the circadian rhythm.
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- This rhythm is what tells us when it is time to eat, sleep or wake up - even when we have no bedside alarm.
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What were the acheievements of the trio?

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- Isolation of a gene called **‘Period’** in fruit-flies that disrupted its circadian clock was the most important acheivement.
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- **PER –** A protein named ‘PER’ that serves as a functional communicator for the ‘Period Gene’ was discovered.
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- PER was found to accumulate at night & diminish during the day.
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- **Timeless –** A second gene called ‘Timeless’ that acts through its ‘TIM protein’ in conjunction with ‘PER’ was also identified.
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- This was found to cause the seesawing of cellular protein levels.
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- **Doubletime -** A third gene called ‘Doubletime’ was discovered to be the regulator of the frequency of the oscillations.
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What are the implications?

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- The current research has added significantly to the science that studies the linkages between sleep & metabolic activity.
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- The impact of smartphone & other gadgets in disrupting circadian rhythms is already being studied extensively.
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- There is more clarity now, in the link between peak physical performance in sport and the time of the day.
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- Circadian rhythm may well hold the key to future breakthroughs in the modulation and treatment of various diseases.
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Source: The Hindu

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