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Differential binding of CREB, USF and c-Myc to the calreticulin human specific -220C may be linked with the evolution of higher brain functions in human

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We have previously reported a human-specific nucleotide in the promoter sequence of the *calreticulin (CALR)* gene at position -220C, which is the site of action of valproic acid. Reversion of this nucleotide to the ancestral type, -220A co-occurs with severe deficit in higher brain cognitive functions. This mutation has since been reported in the 1000 genomes database at an approximate frequency of 0.0009 in humans (rs138452745). In the current study, we compare the pattern of protein binding between -220C and -220A using electrophoretic mobility shift assay (EMSA) by oligonucleotide probes representing 24 base pairs encompassing -220C>A. Antibodies reactive against transcription factors CREB, USF and c-Myc were used to identify the specific proteins involved in complexes with DNA. Significant increase was observed in the overall protein complexes binding to the -220C allele vs. -220A. The transcription factors, CREB, USF, and c-Myc, were differentially bound to -220C represented by super shifts. We propose that differential binding of CREB, USF and c-Myc to CALR nucleotide -220C may be linked with the evolution of higher brain functions in human.

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Impacts of wind turbines on reptile and bird communities on plateaus of northern Western Ghats in Maharashtra, India

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Wind energy is increasingly being explored as a possible solution to fossil fuel shortage driven energy crisis. Due to its apparent eco-friendly nature, large areas are being identified for setting up for large wind farms. However, in the recent years the 'ecologically benign' nature of wind energy has come under serious scrutiny. Among the most critical argument against diversion of large areas for wind generation is their detrimental effects on bird communities that face serious mortality risks through collisions with wind turbines. Although there are substantial evidences suggesting reduction in bird densities due to wind turbine, little is known about the consequences of this reduction on other taxa. With this background, I tried to assess how reduction in bird densities affects reptile communities, given that birds are amongst the most important predators of reptiles. More significantly, I examined how avian predator densities and activity varied across two treatments-wind turbine and non-wind turbine areas and correlated it to reptile diversity on the Chalkewadi plateau, India's largest operational wind farm. Results indicate that bird densities as well as activity were significantly lower in areas with wind turbines, while reptile density and diversity was significantly higher. These results are indicative of a possible trophic cascade, wherein reduced predation pressure in increased survival in reptiles thereby resulting in greater reptile diversity, highlighting those effects of wind turbines may be more complex than previously anticipated.

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