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Lead Molecules for Molecular Medicine and Omic Studies

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In this paper, new compounds synthesised during the last three and a half decades will be presented. These molecules have become intertwined with omic studies and could serve as leads for molecular medicine. Six such compound classes will be discussed here.

- Methoxyisoxazole quinones prepared have been shown to be potent radiosensitisers *in vitro* for human cancer / tumour cells, which had stopped taking up further radiation.
- New nitrophenyl azides prepared have been shown to exhibit inhibitory activity against *Crotalaria juncea* (Jute) and *E. coli.* In the former, these showed '2, 4-D' like activity. The corresponding amines were used to synthesise biologically interesting 9-Aryl-9H-Purine-6-amines. This work has been cited in a recent patent.
- 5, 6- Dimethoxybenzofuroxan, which exists in two rapidly equilibrating degenerate forms has been shown to possess antifungal activity against *Candida albicans* and other fungi. Based on this benzofuroxan, a new indoloquinoxaline dioxide has been synthesised which could show antibacterial activity.
- A short synthesis of Pyrroloquinoline quinone, P. Q. Q. (Methoxatin) has been developed. This compound is considered to be a new vitamin to prevent heart attacks and strokes.
- New homo and hetero bifunctional crosslinkers have been developed. Similar reagents could be designed based on P.Q.Q., which will be employed for proteomics. Cholesterol /steroid photolabels are also being prepared for lipidomics.
- Dehydrodivanillin, a natural product has been used to prepare antifungal 1, 2, 3-triazoles using the Click reaction.

In vivo and *in vitro* studies are being undertaken for all the above compounds to unravel the underlying biological mechanisms. This has a great potential in the area of omic studies and for developing better diagnostic tools for molecular medicine.