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A Norepinephrine Transporter Assay for the Screening of Natural Products

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The norepinephrine (= noradrenaline) transporter (NET) belongs besides serotonin and dopamine transporters to the family of monoamine transporters and mediates the re-uptake of norepinephrine released from neurons. Therefore, it is an important regulator of noradrenergic neurotransmission. [1]
Various drugs binding to the norepinephrine transporter have been utilised therapeutically for the treatment of several disorders of the central (CNS) and peripheral nervous system (PNS), or cardiovascular disorders. In particular, norepinephrine re-uptake inhibitors are useful drugs in the therapy of depression, attention deficit disorder, obsessive compulsive disorder and panic disorder.
In order to search for plant-derived inhibitors of the norepinephrine transporter, we recently have established a new screening assay based on COS-7 cells, transiently transfected with human norepinephrine transporter cDNA.
Norepinephrine uptake studies were carried out using tritium labelled norepinephrine. Radioactivity was quantified by liquid scintillation counting. The known selective inhibitor nisoxetine and the tricyclic antidepressant desipramine were used as positive controls with IC_{50} values in the range of 5 nM. [2]
Variously modified biphenyl derivatives (R= allyl, vinyl, methyl, alkoxy etc.) showed moderate activity at a concentration of 10 µM. Promising candidates are currently under investigation.

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