

# 9-cis-Retinoic Acid

**9-cis Retinoic Acid (R1777)** is a form of vitamin A. 9-cis Retinoic acid is an endogenous ligand for retinoid X receptors, and like other retinoids, also activates retinoic acid receptors<sup>1</sup>. Retinoids such as 9-cis retinoic acid play a significant role in cell proliferation, cell differentiation, immune function, growth of bone tissue, and activation of tumor suppressor genes. This compound is one of the first commercially utilized retinoids; it displays therapeutic activity in the treatment of Kaposi's sarcoma and chronic hand eczema<sup>2-3</sup>. 9-cis Retinoic acid also exhibits potential benefit in the treatment of other cutaneous disorders such as pityriasis rubra pilaris<sup>4</sup>.

9-cis Retinoic acid displays anticancer activity in the treatment of other cancers as well, including hormone-dependent tumors. Adrenocortical cancer is associated with reductions in endogenous retinoic acid production. In models of adrenocortical cancer, 9-cis retinoic acid decreases cell viability and steroid hormone secretion likely through disruption of cell cycle regulation. In animal models of this cancer, this compound decreases tumor growth<sup>5</sup>. In models of breast cancer, 9-cis retinoic acid suppresses cell proliferation by altering the interaction between retinoid X receptor  $\alpha$  (RXR $\alpha$ ) and replication factor C3 (RFC3); this appears to be the same mechanism by which this compound alters developmental embryonic cell proliferation<sup>6</sup>.

9-cis Retinoic acid also exhibits antioxidative and neuroprotective activities. In models of neurotoxicity induced by methamphetamine administration, 9-cis retinoic acid improves locomotor activity and striatal tyrosine hydroxylase levels, limiting dopaminergic neurodegeneration<sup>7</sup>. This compound improves motor activity and minimizes neurodegenerative symptoms in animal models of Parkinson's disease as well<sup>8</sup>.

This compound is relevant to many other additional research applications. Retinoids are known to play a key role in maintenance of immune function. In several cellular models, 9-cis retinoic acid stimulates immune cell adhesion in both integrin-dependent and integrin-independent manners<sup>9</sup>. Additionally, 9-cis retinoic acid enhances lymphatic vessel proliferation and regeneration in animal models, decreasing symptoms of lymphedema<sup>10</sup>.

#### Other retinoids available include:

All-trans Retinol (R1876)  
All-trans Retinol (high purity, R1877)  
Trans-retinoic Acid (R1870)  
13-cis Retinoic Acid (R1779)  
Retinyl Palmitate (R1879)  
Retinyl Acetate (R1878)  
Etrtinate (E7668)  
Acitretin (A0933)  
*And many others!*

#### References:

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