Paraneoplastic Opsoclonus
In July 1986 a 58-year old woman presented acutely with nausea, vertigo, difficulty focusing and oscillopsia. A diagnosis of labyrinthitis was made.

Two later she was referred with persistent oscillopsia and the sensation that she was hanging upside down.
Admission

O.E extremely ill, vomiting mentally alert, intact speech + titubation, myoclonus, trunkal ataxia

Blood test showed hyponatremia consistent with SIADH

CFS: protein 54 mg/dL, 24 WBC 92% lymphs, multiple oligoclonal bands
Figure 1. Chest x-ray.
Figure 4. Intraductal carcinoma of the Breast
Figure 5. Intraductal carcinoma of the breast
An Antineuronal Autoantibody in Paraneoplastic Opsoclonus

Corinna Budde-Steffen, MD,*†
Neil E. Anderson, MB, ChB,*†
Mark K. Rosenblum, MD,†‡ Francesc Graus, MD,§
David Ford, MD,‖ Beth J. L. Synek, MB, ChB,‖
Shirley H. Wray, MD, PhD,#
and Jerome B. Posner, MD*‡

Sera from 7 patients with paraneoplastic opsoclonus were examined for antineuronal autoantibodies. An antibody against neuronal nuclei was found in serum from a patient with breast cancer, opsoclonus, and ataxia. This antibody recognized 53- to 61-kDa and 79- to 84-kDa antigens in immunoblots of neurons. Antineuronal antibodies were not found in other patients with paraneoplastic opsoclonus.

Figure 7. Western blot. Anti-Ri auto antibody.
Figure 8. Crebellum/Neurones. Anti-Ri antibody against neuronal nuceli.
Figure 9. Anti-Ri antibody against neuron nuclei.
Anti-Ri: An Antibody Associated with Paraneoplastic Opsoclonus and Breast Cancer

F. Antonio Luque, MD, PhD,∗‡ Henry M. Furneaux, PhD,∗‡ Reuven Ferziger, AB,∗‡ Marc K. Rosenblum, MD,‡ Shirley H. Wray, MD, PhD,§ S. Clifford Schold, Jr, MD,‡ Michael J. Glantz, MD,‡ Kurt A. Jaeckle, MD,∗‡ Haim Biran, MD,‡‡ Martin Lesser, MD,‡‡ William A. Paulsen, MD,§§ Mary E. River, MD,∗‡ and Jerome B. Posner, MD∗‡
<table>
<thead>
<tr>
<th>Etiology of Ocular Flutter and Opsoclonus*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parainfectious encephalitis</td>
</tr>
<tr>
<td>Paraneoplastic effect of neuroblastoma and other neural crest tumors (in children)</td>
</tr>
<tr>
<td>Paraneoplastic effects of other tumors (in adults)</td>
</tr>
<tr>
<td>Meningitis</td>
</tr>
<tr>
<td>Intracranial tumors</td>
</tr>
<tr>
<td>Hydrocephalus</td>
</tr>
<tr>
<td>Thalamic hemorrhage</td>
</tr>
<tr>
<td>Multiple sclerosis</td>
</tr>
<tr>
<td>Hyperosmolar coma</td>
</tr>
<tr>
<td>In association with systemic disease: viral hepatitis</td>
</tr>
<tr>
<td>sarcoid</td>
</tr>
<tr>
<td>AIDS</td>
</tr>
<tr>
<td>Side effects of drugs: lithium, amitriptyline, cocaine, phenytoin with diazepam, phenelzine with imipramine</td>
</tr>
<tr>
<td>Toxins: chlordecone, thallium, strychnine, toluene, and organophosphates</td>
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<tr>
<td>As a complication of pregnancy</td>
</tr>
<tr>
<td>As a transient phenomenon of normal infants</td>
</tr>
</tbody>
</table>

*Not all case reports have documented the abnormality with eye movement recordings.

†As a component of the syndrome of myoclonic encephalopathy of infants ("dancing eyes and dancing feet"). 213, 451
Three-dimensional scleral search coil recordings of the torsional, vertical, and horizontal eye position (from top to bottom) of Patient 1 show two states of action: in darkness (A) and with the eyes closed (B) there is no opsoclonus. In contrast, when the eyes are opened (vertical dashed lines), there is profound opsoclonus on fixation in all traces. \(E_h = \) horizontal; \(E_v = \) vertical; \(E_t = \) torsional eye position; \(CW = \) clockwise; \(CCW = \) counterclockwise.
Figure 11. Functional MRI during opsoclonus: activation is found in the cerebellum but not in the pontine brainstem in both patients. For better illustration, only the cerebellum and brainstem are shown. Increased activation is shown on individual brain images for the sagittal (s), coronal (C), and transversal (T) slices at the level of highest activation in the midline cerebellum for Patient 1 (upper left, red) and Patient 2 (upper right, green) separately. Lesions are schematically drawn on the corresponding cryosections of the MRI atlas of the human cerebellum.

Courtesy of C. Helmchen
Paraneoplastic Opsoclonus

Age at onset of CNS symptoms, range from 29 to 77 years, mean age 57 years
Men and women equally affected
The associated tumors include undifferentiated small cell Ca lung, Ca ovary and Ca breast
Recognition of the motility disorder can lead to detection of the tumor
Paraneoplastic Syndromes

The remote effects of cancer on the body are collectively known as paraneoplastic syndromes.

The visual system, the CNS, the peripheral nervous system, the neuromuscular junction and the skeletal muscles may be affected indirectly by malignancy.

Clinical signs may predate discovery of a primary tumor.
Anti-Ri autoantibody is similar to anti-Hu. It reacts with an antigen present in the nuclei of neurons throughout the central nervous system but not in glial nuclei or systemic tissues. It is not species restricted in its distribution; and it is also detected in the cytoplasm of neurons but cytoplasmic staining is less prominent than the reaction with nuclei.

