Sarcoidosis is a chronic multisystem disorder of unknown etiology that is characterized by the formation of noncaseating epithelioid cell granulomas affecting multiple organ systems, most commonly including the lungs, skin, and eyes. Active sarcoidal granulomas consist predominantly of aggregates of epithelioid macrophages and CD4+ T cells. Although the overall pathogenesis is poorly understood, the role of the type 1 helper T (T_{h1}) cell in sarcoidal granuloma formation has been well documented, and the T_{h17} pathway in sarcoidosis is just now being investigated. T_{h17} cells are also known to be involved in the pathogenesis of psoriasis, and the coexistence of sarcoidosis and psoriasis is mechanistically plausible based on potential shared underlying immunologic pathways.

We report a case series of 7 patients with concomitant sarcoidosis and psoriasis vulgaris. All patients had psoriasis ranging from limited disease to involvement of 30% of their body surface area and had evidence of pulmonary sarcoidosis. Three of these patients also had cutaneous sarcoidosis, and 1 of these patients had evidence of both psoriasis and sarcoidosis in the same cutaneous specimen.

We report a case series of concomitant sarcoidosis and psoriasis, suggesting that common pathogenesis involving the T_{h1} and T_{h17} pathways may be responsible for this disease association. Although additional data are needed to clarify this association, this observation may lead to important understanding of the pathophysiologic and therapeutic management in these disorders.
amination was notable for indurated violaceous papules involving his periocular, perinasal, and perioral areas and erythematous plaques with silvery scale on his arms, back, buttocks, and legs (Figure 1A and B). Skin biopsies of his left arm and right thigh were performed. Histopathologic findings from his arm demonstrated psoriasiform hyperplasia with underlying compact granulomas in the superficial reticular and papillary dermis that were composed of epithelioid histiocytes, multinucleated giant cells, lymphocytes and neutrophils (Figure 1C). Findings from an evaluation of the skin from his right thigh were consistent with psoriasis (Figure 1D). Results from the laboratory evaluation were notable for an elevated level of angiotensin-converting enzyme (ACE) level at 98 U/L (range, 12-68 U/L) and normal complete blood cell count (CBC), comprehensive metabolic panel (CMP), calcium level, urinalysis (UA), and thyroid stimulating hormone (TSH) level. (To convert ACE to nanokatals per liter, multiply by 16.667.) The chest radiograph was notable for hilar lymphadenopathy. Treatment with methotrexate for both his sarcoidosis and psoriasis was instituted, with improvement after 8 weeks, clearance of the psoriasiform eruption after 3 months, and complete resolution of both processes after 6 months. 

Patient 2
A 46-year-old woman with a history of albinism and biopsy-proven cutaneous and pulmonary sarcoidosis noted worsening of violaceous nodules on her body. She was legally blind, which was attributed to ocular involvement of sarcoidosis. Despite treatment with oral prednisone, her skin continued to worsen. Other medications included inhaled corticosteroids and ibuprofen. Physical examination demonstrated firm violaceous nodules on her arms, lower legs, and hip (Figure 2A) and scattered, erythematous plaques (Figure 2B). Findings from a skin biopsy specimen from her arm was consistent with psoriasis and distinct from her prior cutaneous sarcoidosis (Figure 2C and D). Laboratory evaluation were remarkable for an ACE level of 107 U/L and normal results for CBC, CMP, calcium and TSH levels, and UA. A chest radiograph and computed tomographic scan demonstrated extensive parenchymal lung disease with bilateral hilar and mediastinal lymphadenopathy. She was started on methotrexate for pulmonary, cutaneous, and ocular sarcoidosis with clearance of her psoriatic lesions within weeks and gradual improvement in her sarcoidosis lesions after approximately 3 months.
Patient 3
A 44-year-old man with a 2-year history of psoriasis maintained on narrowband UV-B therapy developed new indurated, mauve-colored plaques on his back, chest, and thighs that were not responsive to therapy and differed from his background psoriatic plaques (Figure 3A). A biopsy of a representative area demonstrated granulomas throughout the dermis (Figure 3B) which differed from his psoriatic disease (Figure 3C). On further review of systems, he had been experiencing dyspnea and previously diagnosed with chronic obstructive pulmonary disorder and heart failure. Additional workup was remarkable for an ACE level of 71 U/L, and normal TSH level and results for CBC, CMP, and UA. Evaluation by a pulmonologist and a cardiac magnetic resonance imaging scan to evaluate for cardiac sarcoidosis are pending. He was started on monotherapy with minocycline, 100 mg twice daily, for his sarcoidosis, and maintained on narrowband UV-B phototherapy (NBUVB) twice weekly for his psoriasis disease; the violaceous erythema and induration of his plaques faded over 2 months, and his psoriasis gradually partially responded to NBUVB.

Additional cases seen in our practice over the past 12 months are included in the Table.

Discussion
We report a case series of 7 patients with both sarcoidosis and psoriasis vulgaris, all of whom had psoriasis that ranged from limited disease to involvement of 30% of their body surface area and evidence of pulmonary sarcoidosis (Table). Three of these patients also had cutaneous sarcoidosis, and 1 of these patients had evidence of both psoriasis and sarcoidosis in the same cutaneous specimen (patient 1) (Figure 1O). Interestingly, multiple patients were treated with methotrexate for both diseases with improvement in both their sarcoidosis and psoriasis.
One of the patients received prior treatment with adalimumab for psoriasis and psoriatic arthritis, with this treatment initiated after the diagnosis of pulmonary sarcoidosis had been established. Notably, 2 patients also had a history of deep vein thromboses, although our population is too small to draw any conclusions related to hypercoaguability. The association of sarcoidosis and psoriasis has been rarely reported.6-9 In these cases, the patients also all had evidence of pulmonary sarcoidosis and cutaneous psoriatic plaques, and in 1 reported case, the patient also had cutaneous sarcoidosis. Because of the rarity of the cases, these reports were felt to be purely coincidental. Sarcoidosis can present with clinically psoriasiform lesions that demonstrate noncaseating granulomas on biopsy; in these cases, the patients were not thought to have psoriasis but rather overlying psoriasiform hyperplasia in the context of sarcoidosis.10,11 In our series, all of the patients had

### Table. Summary of Patients With Both Sarcoidosis and Psoriasis

<table>
<thead>
<tr>
<th>Patient No./Sex/Age, y</th>
<th>Sarcoidosis</th>
<th>Psoriasis Involvement, % BSA</th>
<th>Therapy</th>
<th>Other Medical Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/M/69 Pulmonary, ocular, cutaneous</td>
<td>8</td>
<td>Methotrexate, 15 mg weekly; topical steroids</td>
<td>Arthritis</td>
<td></td>
</tr>
<tr>
<td>2/F/47 Pulmonary, ocular, cutaneous</td>
<td>1</td>
<td>Prednisone; Methotrexate, 15 mg weekly</td>
<td>Albinism</td>
<td></td>
</tr>
<tr>
<td>3/M/44 Pulmonary, cutaneous</td>
<td>8</td>
<td>Minocycline, 100 mg twice daily; NBUVB phototherapy, supplemental oxygen</td>
<td>Coronary artery disease, obesity</td>
<td></td>
</tr>
<tr>
<td>4/F/60 Pulmonary</td>
<td>30</td>
<td>Prednisone, 5 mg daily, inhaled steroids</td>
<td>Deep vein thrombosis</td>
<td></td>
</tr>
<tr>
<td>5/M/41 Pulmonary</td>
<td>3</td>
<td>Topical steroids, inhaled steroids</td>
<td>Vitiligo, coronary artery disease</td>
<td></td>
</tr>
<tr>
<td>6/M/53 Pulmonary</td>
<td>5</td>
<td>Methotrexate, 10 mg weekly; adalimumab, 40 mg every other week</td>
<td>Psoriatic arthritis</td>
<td></td>
</tr>
<tr>
<td>7/F/59 Pulmonary</td>
<td>8</td>
<td>Topical steroids, inhaled steroids</td>
<td>Coronary artery disease, deep vein thrombosis</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: BSA, body surface area; NBUVB, narrowband UV-B phototherapy.
clinical and histologic evidence of cutaneous psoriasis in the presence of sarcoidosis, suggesting an association with these 2 diseases.

The similar pathogenesis of T_{h}1 and T_{h}17 in both sarcoidosis and psoriasis suggest that a common pathway may exist and that the association of these diseases may be more than coincidental. Sarcoidosis, especially sarcoid uveitis, has been demonstrated to be associated with IL23R polymorphism, and suggests that IL23R may be a common susceptibility gene shared by several autoimmune disorders, including psoriasis. In 1 study, enhanced IL-17A expression with IL-17A+, IL-17A+IFN-γ+ and IL-17+IL-4+ memory T_{h}2 cells in sarcoidal granulomas support an important role for T_{h}17 cell involvement in sarcoidosis, as in psoriasis. Similarly, upregulation of IL-12, IFN, as well as the T_{h}17 pathway genes IL23 and IL21 but not IL17 were demonstrated in cutaneous sarcoidosis using molecular profiling, suggesting a difference compared with psoriasis and inflammatory bowel disease, in which there is upregulation of IL-17 and the T_{h}17 pathway. The exact mechanism and etiologic pathway of involvement in sarcoidosis, as in psoriasis. Similarly, sarcoidal granulomas support an important role for TH17 cell


