The Major Internal Protein, p27, of a Retrovirus-like Particle Participates in Immune Complex Formation in Psoriasis

By
O. J. Iversen and E. RødaHL
Department of Microbiology, Faculty of Medicine, University of Trondheim, Trondheim, Norway

With 4 Figures
Accepted January 28, 1985

Summary

The major internal protein, p27, of a retrovirus-like particle isolated from the urine of a patient with psoriasis has been purified and used in an indirect ELISA to detect human antibodies against the virus antigen. Rabbit anti-p27 antiserum has been applied to detect p27 antigen present in clinical specimens.

p27 and anti-p27 antibodies have been demonstrated in extracts from psoriatic scales. Insignificant amounts of free anti-p27 antibodies are present in serum, but both p27 and anti-p27 antibodies have been detected in circulating immune complexes obtained from serum or synovial fluid from patients with psoriatic arthritis.

Introduction

Psoriasis is a disease characterized by an enhanced epidermal cell proliferation (25). An inflammatory response is present in psoriatic lesions indicating that immune reactions play an important role in the pathogenesis of psoriasis. Humoral antibodies have been demonstrated in psoriatic lesions and considerable amounts of IgG and IgA can be extracted from psoriatic scales (17). The concordant formation of immune complexes is indicated by the presence of complement factors (17) and chemotactic factors in psoriatic scales (22, 23).

Recently, we described retrovirus-like particles isolated from patients with psoriasis (6, 11, 12). The particles have a morphology resembling type-C retroviruses, they have a buoyant density in sucrose between 1.15 and 1.18 g/cc.
and they have a protein composition with a surface glycoprotein, gp70, and three internal proteins, p27, p15 and p12 (11, 12). However, we have not been able to demonstrate RNA-directed DNA polymerase activity in the particles (14).

The retrovirus-like particles have been demonstrated in psoriatic plaques and in blisters from psoriatic lesions (1, 6).

The present work demonstrate that antibodies extracted from psoriatic scales and from circulating immune complexes (CIC) react with purified p27 antigen, and that rabbit antibodies against purified p27 cross-react with material from dissociated immune complexes.

**Materials and Methods**

*P27 Antigen and Anti-p27 Antibodies*

**Purification of p27**

Retrovirus-like particles were isolated from the urine of a psoriatic patient by sucrose gradient ultracentrifugation as described previously (12). The major internal protein was purified by fractionation on a Con A sepharose column, immunosorbent chromatography and gel filtration on a Sephaeryl S-300 column in 6 M guanidine hydrochloride as described elsewhere (12, 13). When the purified p27 was subjected to SDS-PAGE, only a single protein with Mr of 30 kD was observed in the gel (13).

**Rabbit Antiserum Against p27**

A hyperimmune serum with specificity for p27 was obtained by immunizing rabbits with purified p27 isolated from 4 litres of urine (13).

**Clinical Specimens**

**Sera**

Sera were obtained from 12 patients with moderate to extensive psoriasis including 3 with peripheral arthritis, and 12 healthy controls without known cases of psoriasis in their families.

**Psoriatic Scales**

Scales were obtained from three patients with extensive psoriasis. The scales (50 mg) were incubated with 1 M propionic acid (0.6 ml) for 15 minutes at 20°C. The mixture was cleared by centrifugation at 10,000 × g for 10 minutes and the supernatant was sterilized by filtration through a 0.22 μm Millipore filter followed by dialysis against phosphate buffered saline pH 7.2 (PBS) at 4°C. The total concentration of protein, IgG and IgA in the extracted material was quantitated as indicated below.

**Circulating Immune Complexes (CIC)**

Sera were collected from 8 patients with peripheral psoriatic arthritis including one case where synovial fluid was also obtained.

Circulating immune complexes were isolated by isopycnic ultracentrifugation in linear (20–65 per cent w/w) sucrose gradients as described previously (20). The density of the fraction comprising the banding area was 1.26 g/cm³. After dialysis against saline, the complexes were dissociated by adjusting the pH to 10.8 with 0.2 N NaOH.