AMPD2. Using HEK293, surface AMPD2 expression was reduced after Golgi transport inhibition. AMPD2 surface expression was not accompanied by enhanced cell death. Expression of AMPD2 could be confirmed in membrane fractions of HEK293 using immunoblot of precipitated AMPD2 and mass spectrometry, respectively.

Conclusions: Here, we demonstrate for the first-time surface expression of AMPD2 on immune cells enabling these cells to extracellularly convert AMP into IMP constituting a shunt-like mechanism to control the levels of adenosine and extracellular ATP formed from adenine nucleotides thereby controlling immunomodulation.

Disclosure of Interest: None declared

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SAT0039

LL37 UP-REGULATION AND ANTI-LL37 REACTIVITY ARE SHARED BY PSORIASIS AND PSORIATIC ARTHRITIS PATIENTS

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Background: The antimicrobial peptide LL37 plays a pathogenic role in psoriasis (Pso) due to its adjuvant and auto-antigenic properties. At least a third of Pso patients develop psoriatic arthritis (PsA) but mechanisms that lead PsA development in Pso patients remain elusive.

Objectives: To understand the role of LL37 in PsA pathogenesis and its relationship with inflammatory molecules IFN α , GM-CSF, C5a.

Methods: Blood samples were collected from 32 biologic-naïve PsA, 12 active Pso (without PsA) patients and 8 healthy donors (HD). Synovial fluids (SF) were collected from 17 PsA and 12 osteoarthritis (OA) patients. Synovial biopsies from 3 biologic-naïve PsA patients were studied by confocal microscopy. Native-LL37 was synthesised and carbamylated LL37 (LL37carb) produced by incubating LL37 with 1 M potassium cyanate and verified by dot-blot assay. Antibodies to native-LL37/LL37carb and levels of LL37, GM-CSF, IFN α and complement C5a were measured by in-house and commercial ELISA tests, respectively, in SF and plasma.

Results: High LL37 levels were detectable in SF of PsA compared to OA. Anti-LL37 [24% in SF (4/17)] and anti-LL37carb antibodies [47% in SF (8/17), 46% in plasma (15/32)] were present in PsA but not in OA and HD. Anti-LL37carb antibodies [41% (5/12)] were also detectable in Pso plasma. IFN α was present in 37% of SF PsA (7/16; not detectable in OA) and correlated with C-reactive Protein (CRP); GM-CSF and C5a levels were significantly higher in SF PsA than in SF OA. Notably, GM-CSF was also detectable in 40% and 30% of PsA and Pso plasma, respectively, but not in HD; Plasma C5a levels were comparable between PsA and Pso and significantly higher than in HD. SF GM-CSF correlated with anti-LL37carb autoantibodies. Anti-LL37carb antibodies correlated with levels of C5a in Pso and PsA plasma. In synovial tissues of PsA the expression of the IFN-related gene MX1 was highly up-regulated in close proximity of neutrophil markers myeloperoxidase and LL37.

Conclusions: LL37 and, in particular, LL37carb is the target of autoantibodies that correlate with pro-inflammatory GM-CSF and C5a in both Pso and PsA, suggesting immunological pathways in common between psoriasis and psoriatic arthritis.

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SAT0040

SAFETY, TOLERABILITY, PHARMACOKINETICS AND PHARMACODYNAMICS OF BCD-089, NOVEL MONOCLONAL ANTI-IL-6 RECEPTOR ANTIBODY: RESULTS FROM THE FIRST-IN-HUMAN SINGLE DOSE ESCALATION STUDY IN HEALTHY VOLUNTEERS

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Background: BCD-089 is a fully human monoclonal antibody targeting membrane-bound and soluble forms of IL-6R α , thereby blocking of IL-6 classic and trans- signalling. IL-6, a proinflammatory cytokine, plays a central role in the pathogenesis of many chronic inflammatory and autoimmune diseases. Thereby inhibition of IL-6 signalling is a promising approach in the treatment of immune-mediated pathology.

Objectives: To assess safety, immunogenicity, pharmacokinetics and pharmacodynamics of a single administration of BCD-089.

Methods: This was a phase I, open label, single ascending dose clinical study in healthy male volunteers, aged 22–37 years (n=19). In 1st cohort, one «sentinel» volunteer received 0.006 mg/kg of BCD-089. Volunteers in cohorts 2–7 received single doses of BCD-089 0.3, 0.625, 1.0, 1.6, 2.2 and 2.9 mg/kg, respectively. Every next cohort was included after completed safety evaluation for the previous one. Safety, PK/PD and immunogenicity were assessed during 71 days follow up.

Results: All enrolled subjects have completed follow up period of 71 days. No withdrawals occurred. Single SC administration of BCD-089 was well tolerated and showed good safety profile at all tested doses: no grade 3/4 AEs, SAEs, DLTs or allergic reactions were reported in any cohort. None of the volunteers developed ADA to BCD-089. The only AEs reported were grade 1 or 2 laboratory abnormalities.

Abstract SAT0040 – Table 1. Subjects with abnormal test results, n (%). Table shows only cohorts where at least one abnormal test result was reported.

Adverse events	0.3 mg/kg (n=3)	0.625 mg/kg (n=3)	1.0 mg/kg (n=3)	2.2 mg/kg (n=3)	2.9 mg/kg (n=3)
Grade 1 WBC decrease	-	-	1 (33.3%)	2 (66.6%)	1 (33.3%)
Grade 1 neutropenia	-	-	1 (33.3%)	1 (33.3%)	-
Grade 2 neutropenia	-	-	-	1 (33.3%)	1 (33.3%)
Grade 2 t.bilirubin increase	-	1 (33.3%)	-	-	-
Grade 1 AST decrease	1 (33.3%)	-	-	-	-
Grade 1 Creatinine decrease	-	1 (33.3%)	-	-	-

Single SC administration of BCD-089 had a dose-dependent PK: the drug became detectable in the serum within the first 12 hour after injection for all tested doses (2–8 hour for doses>1.0 mg/kg). Serum concentration dose-proportionally increased and reached maximum at day 3 after administration, then gradually decreased. Elimination half-life showed significant inter-personal variability and dose-dependency, reflecting non-linear PK typical for drugs with target-mediated disposition.

Abstract SAT0040 – Figure 1. BCD-089(A), sIL6R(B), IL6(C) and CRP(D) serum concentration (Median and IQR).

The concentration of soluble IL-6 receptor increased after BCD-089 administration in a dose-dependent manner. A raise in the concentration of IL-6 was seen at doses >1.0 mg/kg. Membrane IL-6R saturation of 90%>100% was seen at doses ≥0.6 mg/kg. Regardless to the dose, serum CRP decreased below the limit of detection in most volunteers within the first week after injection. All tested PD markers returned to baseline at the end of the follow-up.

Conclusions: Single SC administration of BCD-089 was well tolerated, showed favourable safety profile and low immunogenicity at all tested doses in healthy volunteers. PK/PD assessment revealed non-linear PK and significant capacity to inhibit the IL-6 signalling pathway. These findings support further clinical development of BCD-089.

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SAT0024

IL-36 AXIS IS AN EMERGING THERAPEUTIC TARGET IN PSORIATIC ARTHRITIS SYNOVIAL TISSUE

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Background: The IL-36 family of cytokines includes three agonists, IL-36 α , IL-36 β and IL-36 γ , and two established or hypothetical antagonists, respectively IL-36Ra and IL-38. IL-36 agonists are pro-inflammatory cytokines highly expressed in skin and involved in the pathogenesis of psoriasis. A recent study demonstrated that only a subset of patients with rheumatoid arthritis (RA) had an elevated IL-36 agonists/antagonists ratio within the synovium and could potentially respond to IL-36 inhibition strategies but little is known about the expression and biologic functions of the IL-36 axis in synovial tissue of psoriatic arthritis (PsA) so far hardly been studied.

Objectives: In this study, we aimed to comparatively investigate the expression and role of IL-36 cytokines in synovial tissue of early RA and PsA patients.

Methods: Synovial tissue samples were collected from patients with early RA and PsA (disease duration <12 months) DMARDs (Disease Modifying Anti-Rheumatic Drugs) and steroids-naïve. All patients underwent an ultrasound-guided synovial biopsy before starting the treatment; the procedure was repeated following six months of treatment with conventional DMARDs. The expression of IL-36 family members was investigated in synovial tissue at gene level by RNA-Sequencing (87 RA, 15 PsA), at protein level by immunohistochemistry (IHC) and immunofluorescence (IF) (20 RA, 26 PsA) and in plasma by ELISA (22 RA, 38 PsA). RA and PsA-fibroblasts-like-synoviocytes (FLS) and peripheral blood mononuclear cells (PBMCs) were treated *in vitro* to assess their response to IL-36 stimulation.

Results: Gene and protein expression of IL-36 agonists was comparable between RA and PsA synovial tissue; conversely, the antagonists IL-36Ra and IL-38 were significantly lower in PsA compared to RA. Accordingly, the agonists/antagonists ratio was considerably higher in PsA synovium, suggesting an activation of the IL36 pro-inflammatory pathway. Among the immune cells infiltrating the PsA synovium, macrophages (CD68+), T lymphocytes (CD3+) and plasma cells (CD138+) were the primary IL36 α -expressing cells. At baseline, the synovial expression of IL-36 α was significantly higher in PsA patients who did not respond to DMARDs treatment at 12 months; this differential synovial expression of IL-36 α between responders and non-responders was also maintained at six months. In keeping with this observation, we showed that treatment with methotrexate or sulfasalazine did not reduce the expression of IL-36 in PsA cells *in vitro*. Finally, we observed that PsA-FLS and PsA-PBMCs produced significantly higher levels of IL-8 upon stimulation with IL-36 α in comparison with cells isolated from RA patients.

Conclusions: The expression of the anti-inflammatory IL-36 cytokines antagonists are differently regulated in early RA and PsA, being significantly lower in the latter. Moreover, the pro-inflammatory IL-36 α is up-regulated in synovial tissue of PsA non-responders to conventional DMARDs. The impaired balance between agonists and antagonists might contribute to the persistent inflammation characterising the diseased tissue. The exogenous replacement of the IL-36 antagonists may be a novel promising therapeutic target for PsA patients.

Disclosure of Interest: None declared

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SAT0025

CXCL4 ALTERS TRANSCRIPTOMIC AND EPIGENETIC IMPRINTING OF DENDRITIC CELLS THEREBY DRIVING FIBROSIS THROUGH EXTRACELLULAR MATRIX FORMATION

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Background: Aberrant accumulation of extracellular matrix (ECM) in multiple organs or fibrosis is one of the three hallmarks that characterises the pathogenesis of systemic sclerosis (SSc), together with immune dysregulation and small vessel vasculopathy. Recent studies have shown that CXCL4 (Chemokine CXC motif ligand 4) levels are increased in patients with SSc and correlated with skin and lung fibrosis.¹ CXCL4 plays key role in physiological processes, although it has been also implicated in several pathological conditions such as autoimmune diseases and cancer. We and others have shown that CXCL4 modulates the phenotype and function of immune cells², suggesting a critical role of this chemokine in innate and adaptive immune responses. However, how CXCL4 exactly modulates immune cell responses remains unclear.

Objectives: Here we investigated the impact of CXCL4 exposure on the transcriptome and DNA methylation of monocyte-derived dendritic cells (moDCs), and the consequence on their function.

Methods: We differentiated human moDCs in the presence of CXCL4. After 6 days differentiation, cells were stimulated with a TLR3 ligand (polyI:C) as described in our previous study.² RNA sequencing and DNA methylation profiling was performed at various time points during differentiation and stimulation.

Results: Integration of high-throughput analyses of RNA sequencing and DNA methylation reveals that CXCL4 drives to dramatic changes on the transcriptome and epigenome levels. This is reflected in the dysregulation of critical innate and adaptive immune pathways, like antigen presentation, and cytokine signalling. For the first time, we show that CXCL4 potentiates a novel function to dendritic cells, namely, the production of ECM molecules, such as fibronectin (FN1) and osteopontin (OPN). Furthermore, we also found that CXCL4 exposure results in epigenetic imprinting during moDC differentiation. Using novel bioinformatic methods, we have found that CXCL4 mediates the altered cell function via key transcriptional regulators.

Conclusions: This study provides better understanding how CXCL4 affects moDCs through several immune and non-immune pathways and shows for the first time the direct implication of CXCL4 on the production of ECM by inflammatory cells, thereby underscoring the pivotal role of CXCL4 in inflammatory and fibrotic conditions such as SSc.

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SAT0041

COMPARISON OF DIFFERENT TYPE 1 IFN SIGNATURES DEMONSTRATES CONCORDANCE IN A REAL WORLD, HOME MONITORED SYSTEMIC LUPUS ERYTHEMATOSUS COHORT

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Background: Type 1 Interferon (IFN) expression has been shown to correlate with disease severity in systemic lupus erythematosus (SLE) patients¹ and anti-IFN biologics are being evaluated in a clinical setting.² The 4-gene IFN response signature of IFI27, IFI44, IFI44L and RSAD2² is frequently used to determine IFN expression. However, numerous studies have reported on the use of different gene signatures.^{3, 4, 5} The impact of using different IFN gene signatures to stratify SLE patients is unclear.