

P138 PRECLINICAL AND CLINICAL CHARACTERIZATION OF CENERIMOD, A POTENT, SELECTIVE, AND ORALLY ACTIVE SPHINGOSINE-1-PHOSPHATE RECEPTOR 1 MODULATOR IN SLE

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Background Reported here is the characterization of cenerimod, a novel, potent, selective, and orally active sphingosine-1-phosphate receptor 1 (S1P₁) modulator in the context of SLE.

Methods Lymphocytes from patients with SLE and healthy subjects were assessed for cenerimod-induced S1P₁ receptor internalization. Efficacy of cenerimod was evaluated in the MRL/lpr lupus mouse model. In a 12-week phase 2 clinical trial in SLE subjects treated with multiple doses of cenerimod (NCT02472795), lymphocyte subsets and inflammatory biomarkers were characterized.

Results Cenerimod was potent and efficacious at inducing S1P₁ receptor internalization in T and B lymphocytes with an EC₅₀ of ~15 nM in both healthy subjects and patients with SLE. In lupus-like MRL/lpr mice treated with cenerimod, circulating T and B lymphocytes were reduced, which resulted in reduced immune infiltrates into tissue, reduced autoantibody production and inflammation, preserved organ function, and increased survival. In SLE subjects treated with cenerimod for 12 weeks, a dose-dependent reduction of circulating T cells (95%), B cells (90%), and antibody-secreting cells (85%) was evident. Furthermore, a reduction in anti-dsDNA antibodies and IFN- α , two key inflammatory molecules, was observed.

Conclusion Cenerimod was potent and efficacious in reducing S1P₁ receptor surface expression on lymphocytes, resulting in reduced circulating T and B lymphocyte populations, including antibody-secreting cells, and a decrease in inflammatory biomarkers in SLE subjects. Furthermore, cenerimod significantly ameliorated systemic and organ-specific autoimmunity in a mouse model of SLE. These results warranted the further investigation of the clinical efficacy and safety of cenerimod in the ongoing phase 2b clinical trial (NCT03742037).

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P140 VERDINEXOR, A SELECTIVE INHIBITOR OF NUCLEAR EXPORT (SINE), AMELIORATES CELLULAR AND MOLECULAR PATHOGENIC IMMUNE MECHANISMS OF SYSTEMIC LUPUS ERYTHEMATOSUS

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Background SLE is an autoimmune disease characterized by activation of the innate and adaptive arms of the immune

system. Recently the nuclear export protein exportin-1 (XPO1) has surfaced as an attractive target for the treatment of SLE. Verdinexor is a potent, orally available and well-tolerated XPO1 inhibitor. Verdinexor inhibits the nuclear export of ~220 cargoes, and this pleiotropic effect leads to dampening of the NF- κ B and IL-6 responses and is linked to its global anti-inflammatory effects. Thus, we examined the ability of verdinexor to alleviate the pathogenic mechanisms underlying SLE.

Methods The minimal efficacious dose of verdinexor was determined in mice with established disease. Mice were dosed with verdinexor for four weeks, followed by treatment cessation for four weeks. Then, escalating doses of verdinexor were tested for their ability to control recurrent disease. We enumerated pathogenic plasma cells (PC), plasmablasts (PB), and T cells in the spleen and bone marrow (BM) and measured systemic inflammatory cytokines and chemokines. Elucidation of the mechanism of PC and PB depletion in human BM from healthy and SLE patients is underway.

Results Verdinexor treatment at 7.5 mg/kg weekly significantly decreased germinal center B cells, PC and PB in the BM and the spleen four weeks after resumption of treatment without affecting normal cells. Furthermore, levels of pro-inflammatory cytokines, chemokines, and B cell survival factors were all significantly decreased. Results from assays in human BM have confirmed these findings.

Conclusions Verdinexor has demonstrated efficacy in a murine model of SLE by reducing generation, survival and function of auto-reactive immune cells without affecting normal cells. It is likely that inhibition of the NF- κ B pathway and impaired IL-6 production underlie verdinexor's efficacy. Taken together with our findings in human BM cells, these data suggest the potential of verdinexor to have a significant impact on disease progression in lupus patients.

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P141 OCCURRENCE OF NEUROPSYCHIATRIC MANIFESTATIONS IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS: RESULTS FROM THE SWISS LUPUS COHORT AND META-ANALYSIS OF THE PERTINENT LITERATURE

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Background Systemic lupus erythematosus (SLE) is a systemic autoimmune disease, often presenting with neuropsychiatric manifestations. Reports on the frequency and patterns of these manifestations vary substantially and remain incompletely understood. We examined neuropsychiatric manifestations in the prospective nationwide cohort of Swiss SLE (SSCS) patients and conducted a systematic literature review to contextualise our findings.

Methods We reviewed all patients included in the SSCS from 2007–2019 and classified severe neuropsychiatric manifestations. Searches were performed in relevant electronic databases from 1.1999–1.2020 and by checking reference lists of the pertinent literature. Authors of important papers were contacted to obtain further (unpublished) studies. We included

prospective or cross-sectional studies focussing on neuropsychiatric manifestations in SLE, defined according the ACR criteria of 1999. Study selection and data extraction was made in duplicate. We secured salient study characteristics, composition of cohorts, the definitions and the frequencies of neuropsychiatric manifestations. We assessed heterogeneity across reports and investigated sources of variation using meta-regression models.

Results The frequencies of severe manifestations found in the SSLE were 7.1% (49/688) for cerebrovascular events, 5.3% (37/688) for seizures and 6.5% (45/688) for psychosis. The time-to-event analysis showed a linear relationship between duration of SLE and cumulative incidence of severe neuropsychiatric manifestations. Searches identified 530 studies and authors' contact yielded another unpublished report. We included 28 studies. The mean rates of the most commonly reported severe neuropsychiatric manifestations ranged in the magnitude of 50 percent points. Study characteristics and composition of cohorts could not explain heterogeneity of reported manifestation rates.

Conclusions The spectrum of neuropsychiatric manifestations in SLE is widely dispersed. The diagnostic work-up and the reporting of manifestations varied substantially across studies which may explain inconsistencies to some extent. We call for concerted efforts and a broad consensus regarding stringent definitions of neuropsychiatric SLE manifestations that allow targeted detection, particularly with view to timely intervention and patient outcomes.

P142 LUPUS EUROPE – WHEN PATIENTS HELP RESEARCH

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Background Patients involvement has massively changed over the years. From patients as 'objects' of care, we have moved to patient centric approaches and are now embarking at full speed in the era of patients as partners. To better meet this evolution, a radical change is taking place in Patient organisations. LUPUS EUROPE is one of the leading players. LUPUS EUROPE's 1st strategic objective is that 'People with Lupus participate, and benefit from, Lupus Research'.

Methods We have stepped up our capacity and capability by creating a Patient Advisory Network, organising 'naïve' patient panels - by and for lupus people; and running surveys in the community.

Results Our Patient Advisory Network now comprises 18 patients that are investing time and effort to develop their knowledge and to help academics, investigators, industry and other partners. They are currently engaged in more than 20 different projects. We are active in the ERN ReCONNET, EURORDIS and EJP RD. Our patient panels have already addressed the topics of: defining treatment; adherence; clinical trials and youth. Our latest research, on Hydroxychloroquine, obtained 3500 answers from all over Europe. Thanks to this stepped-up capability, we are also now ready to work with EMA, as an EMA eligible entity.

Conclusions Lupus Europe is ready to partner where it can add value, and to receive requests for support from

researchers. In 2020 again, we will launch significant initiatives in the research area: A large scale survey on 'living with lupus in 2020'; the collection of feedback from participants in clinical trials to see how we can improve them and increase participation; and a further stepping up of the skills of our Patient Advisory Network. We need your help to increase our reach and work on jointly beneficial projects.

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P143 LUPUS EUROPE – WHAT WE LEARNED FROM PATIENT PANELS

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Background Much remains to be discovered about Lupus. Not just disease mechanisms and new treatments, but also better understanding the day to day issues faced by patients and their relatives, the impact on social and psychological functioning,... To help people living with lupus bring their life experience to the table, LUPUS EUROPE created patient panels, by and for people with lupus.

Methods Over the past years, Lupus Europe conducted 3 patient panels. Each panel, from Friday evening to Sunday afternoon brought together 10 to 12 diverse European (semi-) naïve patients around 1 theme, with 8–10 'activities' exploring the subject. The panels were moderated by people living with lupus themselves.

Results Our panels have brought insights that we think are relevant for doctors and researchers in lupus. Amongst those:

- Patients define treatment much broader than doctors. They view treatment as 'any product or activity that aims at improving the person with lupus' quality of life', not just prescription drugs.
- The patient-doctor relationship impacts adherence, with unmet needs in the area of 'understanding each component of the treatment', 'having concerns raise acknowledged even if not irrelevant to diagnose' and 'feeling ownership for the treatment plan'.
- Youth acknowledge their top issue is taking pills every day, but preferred to focus on collective issues. Young women's feeling of guilt (imposing limits, having children, 'contaminating' them...) is likely underestimated by doctors and patient organizations.
- Young people are more positive on their life than average patients. They perceive lupus as being 'all over their lives', but want to make sure they are not ruled by it, and want to have no obligations relating to it...

Many additional panel conclusions are available on <https://www.lupus-europe.org/patient-panels/>

Conclusions Lupus Europe's panels provide an opportunity to gather insights that can feed the patient-doctor relationship and contribute to a better understanding of the disease.

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