



**CHARACTERIZATION OF ISOLATED LYMPHOID
AGGREGATIONS IN THE MUCOSA OF THE SMALL
INTESTINE**

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ABSTRACT

Novel lymphoid structures which may be sites of T-cell differentiation have been identified in rat and mouse small intestine. These structures have been designated as lymphocyte-filled villi (LFV). They are present in conventional and in mutant mice (nude, scid mice, RAG-1, LT α , LT β , TNF α and TNF/LT knockout mice). Similar structures have been identified in the small intestine from Syrian hamsters.

The main population of lymphocytes in LFV in mice, expressed the CD45 and Thy-1 antigens. The majority of them did not stain with antibodies against either T cell (CD4, CD8, CD3, α/β TCR, γ/δ TCR), B cell (B220 and anti-Ig) or natural killer (NK1.1) markers. They were located in the centers and bases of LFV and they expressed the IL-2R α and the antigens TSA-1, Sca-2, HSA and Pgp-1. They were sensitive to hydrocortisone and a significant proportion of them were actively dividing cells.

A subset of CD4⁺ cells was identified in the center of LFV. The lack of CD3 expression implies that they were not mature CD4⁺ T cells. These CD4⁺ cells were Sca-2⁺, TSA-1⁺ and IL-2R⁺ and they may be early committed T cell progenitors.

Large non-lymphoid cells with irregular morphology were identified in LFV. They bear the surface markers CD11c and MHC class II molecules and they are believed to be dendritic cells. They were present in subepithelial region and also between the lymphocytes.

This thesis explored the hypothesis that structures similar to lymphocyte-filled villi in rats and mice are present in the human small intestine. Resection specimens of apparently normal human small intestine have been examined histologically and by immuno-histochemistry. Structures that resemble rodent LFV were identified in all of the specimens. The LFV contained MHC class II-positive dendritic cells, a majority of memory T cells, a variable B cell component and no evidence of immature lymphocytes

that expressed either c-kit or CD1a. The absence of HEV in these structures suggests that they are not sites of lymphocyte recirculation. LFV in adult humans do not appear to be sites of primary T cell development.

Two other isolated lymphoid aggregations (isolated lymphoid follicles and submucosal lymphoid aggregations) were also identified in these specimens. They have been shown to be components of a single structure. The complete structure contains a B cell follicle, T cells with mainly memory (CD45RO-positive) phenotype, high endothelial venules and no detectable population of immature lymphocytes. These structures appear to be related to Peyer's patches.

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

1.1	INTRODUCTION AND LITERATURE REVIEW	1
1.1.1	General Organization of the Gastrointestinal Tract	2
1.1.2	The Gut-Associated Lymphoid Tissues (GALT)	5
1.1.2.1	Intraepithelial lymphocytes (IEL)	5
1.1.2.2	Lamina propria lymphocytes (LPL)	8
1.1.2.3	Peyer's patches(PP)	10
1.1.2.4	Isolated lymphoid follicles (ILF)	15
1.1.3	The Effect of Lymphotoxin alpha, Lymphotoxin beta, Tumor Necrosis Factor alpha , Tumor Necrosis Factor and Lymphotoxin alpha in the Development of Lymphoid Organs	17
1.1.3.1	Abnormal development of peripheral lymphoid organs in lymphotoxin alpha (LT- α) deficient mice	17
1.1.3.2	Abnormal development of secondary lymphoid tissues in lymphotoxin beta (LT- β) deficient mice	19
1.1.3.3	Role of TNF in development of peripheral lymphoid organs	19
1.1.3.4	Role of TNF- α and LT- α in lymphoid organogenesis	20
1.1.4	Molecular and Cellular Events of T cell Development	22
1.1.4.1	Early progenitors of T cells in the thymus	22
1.1.4.2	Role of IL-2 and IL-7 in T cell development in the thymus	30
1.1.4.3	T cell receptor gene rearrangement and thymocyte differentiation	33
1.1.4.4	Phenotypic analysis of thymocytes in immunodeficient mice	37
1.1.4.4.1	Severe Combined Immunodeficient (scid) Mice	37
1.1.4.4.2	RAG-1 Knockout Mice	38
1.1.5	Extrathymic T cell Differentiation	39
1.1.5.1	Characteristics of thymus-independent T cells	43
1.1.5.1.1	Hepatic Mononuclear Cells (MNC)	43
1.1.5.1.2	Intraepithelial Lymphocytes (IEL) in the Mouse Intestine	46
1.1.5.1.3	Lymphocyte-filled Villi (LFV) and Cryptopatches	54

CHAPTER 2 MATERIALS AND METHODS

2.1	STUDIES IN MICE AND HAMSTERS	57
2.1.1	Animals	57
2.1.1.1	Mice	57
2.1.1.2	Hamsters	57

2.1.2	Procedure for killing animals	58
2.1.3	Immunological Reagents	58
2.1.3.1	Monoclonal antibodies	58
2.1.3.2	Polyclonal antisera	58
2.1.3.3	Tyramide signal amplification in immunohistochemistry	59
2.1.4	Histology	60
2.1.4.1	Tissue preparation	60
2.1.4.2	Counting of lymphocyte-filled villi	60
2.1.4.3	Measuring the diameter of LFV	60
2.1.5	Immunohistochemistry	61
2.1.5.1	Tissue Processing	61
2.1.5.2	Immunohistochemical Methods	61
2.1.5.2.1	Immunoperoxidase Staining	61
2.1.5.2.2	Single Colour Conventional Immunofluorescence Staining	62
2.1.5.2.3	Single Colour Immunofluorescence (Signal Amplification Method)	62
2.1.5.2.4	Dual-colour Immunofluorescence Staining (Conventional Method)	63
2.1.5.2.5	Dual-colour Immunofluorescence staining with Signal Amplification	64
2.1.6	Photography	64
2.1.7	Enzyme Histochemistry	65
2.1.7.1	Procedure for detecting acid phosphatase	65
2.1.7.2	Procedure for detecting non-specific esterase	66
2.1.8	Cortisone Resistance of Lymphocytes in Lymphocyte-filled Villi	66
2.1.8.1	Hydrocortisone treatment	66
2.1.8.2	Statistical analysis	66
2.1.9	Labelling in vivo with ³ H Thymidine	66
2.2	STUDIES IN HUMAN	67
2.2.1	Small Bowel Specimens	67
2.2.2	Immunological & immunohistochemical reagents	68
2.2.3	Histology	69
2.2.4	Immunohistochemistry	69
2.2.5	Combined histochemistry & Immuno-histochemistry	70
2.2.6	Intraepithelial Lymphocyte (IEL) Counts	70
2.2.7	Statistical analysis	70
2.2.8	Photography	71
2.2.9	Magnification	71

**CHAPTER 3 CHARACTERISATION OF ISOLATED LYMPHOID
AGGREGATIONS IN THE MUCOSA OF THE MOUSE AND
HAMSTER SMALL INTESTINE**

3.1	INTRODUCTION	72
3.2	RESULTS	72
3.2.1	Histological Observations in Normal Mice and Hamsters	72
3.2.1.1	Mice	72
3.2.1.2	Hamsters	74
3.2.2	Histological Observations in Nude Mice, Scid Mice and RAG-1 Gene Knockout Mice	74
3.2.3	Histological Observations in Mice Deficient in TNF α , LT α , LT β or TNF plus LT α	74
3.2.4	Identification the Surface Antigen Phenotype of the Cells in LFV in Normal Mice by Immunohistochemistry and Single-Colour Immunofluorescence	77
3.2.5	Characterization of Large and Irregular Cells in LFV	78
3.2.5.1	Single-colour immunohistochemistry	78
3.2.5.2	Histochemical analysis of acid phosphatase and non-specific esterase activities in the LFV	79
3.2.6	Comparison between the Antigens Expressed by Cells in the LFV, Bone Marrow Haematopoietic Stem Cells and Thymocytes	80
3.2.6.1	Expression of CD25	80
3.2.6.2	Expression of stem cell antigen 2 (Sca-2)	81
3.2.6.3	Expression of stem cell antigen 1 (Sca-1)	81
3.2.6.4	Expression of heat stable antigen (HSA)	82
3.2.6.5	Expression of Pgp-1 antigen (CD44)	82
3.2.6.6	Expression of antigens detected by the MTS panel of monoclonal antibodies	83
3.2.7	Expression of Thymic Stromal Antigens on the Non-lymphoid Cells in LFV	84
3.2.8	Expression of Some T cell Markers by Dendritic Cells in LFV and Comparison with Thymic Dendritic Cells by Dual-colour Immunofluorescence Staining	85
3.3	DISCUSSION	88

**CHAPTER 4 IDENTIFICATION OF CELL SURFACE MARKERS
IN THE LYMPHOCYTE-FILLED VILLI (LFV) OF T CELL-
DEFICIENT MUTANT MICE**

4.1	INTRODUCTION	95
4.2	The Surface Antigen Phenotype of Lymphocytes in LFV in Nude Mice	97
4.3	The Surface Antigen Phenotype of Lymphocytes in LFV in Scid Mice	98
4.4	The Surface Antigen Phenotype of Lymphocytes in LFV in RAG-1 Gene Knockout Mice	99
4.5	DISCUSSION	102

**CHAPTER 5 FURTHER CHARACTERIZATION OF THE LYMPHOCYTES
IN LFV BY DUAL COLOUR IMMUNOFLUORESCENCE AND
OTHER BIOLOGICAL PROPERTIES**

5.1	INTRODUCTION	105
5.2	Further Characterization of Cell Surface Markers by Dual Colour Immunofluorescence	107
5.3	Cortisone Resistance of Lymphocytes in LFV	110
5.4	Cell Division by Lymphocytes in LFV	111
5.5	Assessment of RAG-1 Gene Expression by Lymphocytes in LFV	112
5.6	DISCUSSION	114

**CHAPTER 6 CHARACTERIZATION OF ISOLATED LYMPHOID
AGGREGATIONS IN THE MUCOSA OF THE HUMAN
SMALL INTESTINE**

6.1	INTRODUCTION	119
6.2	RESULTS	120
6.2.1	Histological Observations	120
6.2.1.1	Peyer's patches (PP)	120
6.2.1.2	Structure of isolated lymphoid follicles (ILF) and submucosal lymphoid aggregates (SLA)	121

6.2.1.3	Lymphocyte-filled villi (LFV)	122
6.2.1.4	Intraepithelial lymphocytes (IEL) in the epithelium covering ILF and LFV	122
6.2.2	Identification of Cell Surface Markers by Immunohistochemistry	123
6.2.2.1	Peyer's patches (PP) and classical villi	123
6.2.2.2	Isolated lymphoid follicles (ILF)	124
6.2.2.3	Lymphocyte-filled villi (LFV)	125
6.2.3	Subsets of Intraepithelial Lymphocytes (IEL) in the Epithelium of Lymphoid Aggregations	128
6.4	DISCUSSION	130
CHAPTER 7 CONCLUSION		
7.1	SUMMARY AND CONCLUSION	138
7.1.1	LFV in Mice	138
7.1.2	LFV in Humans	142
7.2	CONCLUSION AND FUTURE DIRECTIONS	145
REFERENCES		147