Hematology IMPC_HEM_002

Purpose

Hematological assessment of blood determines blood cell counts (white blood cells, red blood cells, hemoglobin, and platelets) and additional hematological parameters (hematocrit, mean cell volume, mean corpuscular hemoglobin, mean cell hemoglobin concentration) can be derived using these indices. These tests will indicate abnormalities in the production of blood and its components (blood cells and hemoglobin) as well as in the associated blood-forming organs.

Ontological description: MP:0002429 - abnormal blood cell morphology/development.

Experimental Design

Minimum number of mutant animals: 7 mice for each sex.

Age of animals: 16 weeks (fixed).

Sexual dimorphism: yes for some of the parameters.

Equipment

1. Hematology automated analyzer (Siemens Advia 120.)

Procedure

Set up the hematological analyser and perform QC analyses of the control reagents in accordance with the guidelines provided by the manufacturer.

Sample collection and preparation:

1. Collect the appropriate volume of blood required for the hematology analyser being used for assessment (~200µl), in tube containing EDTA drop with the relevant blood collection procedure (see IMPC protocol Blood collection by retro-orbital puncture). The time of day for collection is in the morning, starting no earlier than 07:30.
2. Mix the blood sample by tapping the tube a few times immediately and keep the sample at room temperature (for no more than 2 hours) pending analysis. Samples must *not* be frozen at this stage.
3. Analysis of samples is optimally done on the day of collection. When not possible the blood samples can be stored at 2-8°C for up to 24 hours. Long term storage of whole blood is not recommended. All samples are allowed to come to room temperature prior to analysis.

Analysis:

1. Perform hematological assessment of each sample including: white and red blood cell counts, hemoglobin and platelets in accordance with the analyser being used.
2. Derive additional parameters for the sample that may be estimated from the initial assessment such as: hematocrit, mean cell volume, mean corpuscular hemoglobin and mean cell hemoglobin concentration.

Notes

Blood collection for Clinical Chemistry and Hematology is performed as a non-fasting, terminal procedure, with some mice being used for subsequent gross pathology and other clinic-specific parameters included in terminal assessments. Whole blood (for Hematology) and plasma (for Clinical Chemistry) require different collection tubes so two independent samples are required from each mouse. Dilution of blood is highly discouraged, but is allowed when the total necessary amount is not obtained. If dilution is necessary then the assays should be done in one run.

The information about the date of the experiment, that is the date when the measurement is performed, is an important parameter which is to be submitted in the Experiment xml file (dateOfExperiment="2013-02-28").

Data QC

1. Sample must be free of blood clots in order to be analyzed.
2. Some results from hemolysed samples should not be reported.
3. Perform routinely and immediately prior to sample analysis:

1. assessment of control samples with different levels of hematology phenotypes (abnormally low; normal; abnormally high).
2. analysis of the graphical reports generated for each control level to ensure that they lie within their respective ranges.

Parameters

	Version	Type	Increment	Option	Derived	Unit	Data Type
White blood cell count IMPC_HEM_001_001	1.3	simpleParameter				10^3/ul	FLOAT
Red blood cell count IMPC_HEM_002_001	1.3	simpleParameter				10^6/ul	FLOAT
Hemoglobin IMPC_HEM_003_001	1.2	simpleParameter				g/dl	FLOAT
Hematocrit IMPC_HEM_004_001	1.0	simpleParameter				%	FLOAT
Mean cell volume IMPC_HEM_005_001	1.2	simpleParameter				fl	FLOAT
Mean corpuscular hemoglobin IMPC_HEM_006_001	1.1	simpleParameter				pg	FLOAT
Mean cell hemoglobin concentration IMPC_HEM_007_001	1.2	simpleParameter				g/dl	FLOAT
Platelet count IMPC_HEM_008_001	1.3	simpleParameter				10^3/ul	FLOAT
Mean platelet volume IMPC_HEM_019_001	1.2	simpleParameter				fl	FLOAT
Red blood cell distribution width	1.2	simpleParameter				%	FLOAT

	Version	Type	Increment	Option	Derived	Unit	Data Type
IMPC_HEM_027_001							
Neutrophil differential count IMPC_HEM_029_001	1.3	simpleParameter				%	FLOAT
Neutrophil cell count IMPC_HEM_030_001	1.3	simpleParameter				10^3/ul	FLOAT
Lymphocyte differential count IMPC_HEM_031_001	1.2	simpleParameter				%	FLOAT
Lymphocyte cell count IMPC_HEM_032_001	1.3	simpleParameter				10^3/ul	FLOAT
Monocyte differential count IMPC_HEM_033_001	1.2	simpleParameter				%	FLOAT
Monocyte cell count IMPC_HEM_034_001	1.3	simpleParameter				10^3/ul	FLOAT
Eosinophil differential count IMPC_HEM_035_001	1.2	simpleParameter				%	FLOAT
Eosinophil cell count IMPC_HEM_036_001	1.3	simpleParameter				10^3/ul	FLOAT
Basophil cell count IMPC_HEM_037_001	1.1	simpleParameter				10^3/ul	FLOAT
Basophil differential count IMPC_HEM_038_001	1.0	simpleParameter				%	FLOAT
Large Unstained Cell (LUC) count IMPC_HEM_039_001	1.0	simpleParameter				10^3/ul	FLOAT
Large Unstained Cell (LUC) differential count IMPC_HEM_040_001	1.0	simpleParameter				%	FLOAT

Metadata

	Version	Type	Increment	Option	Derived	Unit	Data Type
Equipment ID IMPC_HEM_009_001	1.0	procedureMetadata					TEXT
Equipment manufacturer IMPC_HEM_010_001	1.0	procedureMetadata		Siemens Healthcare Diagnostics Ltd			TEXT
Equipment model IMPC_HEM_011_001	1.0	procedureMetadata		Advia 120			TEXT
Anesthesia used for blood collection IMPC_HEM_012_001	1.0	procedureMetadata		No anesthesia			TEXT
Method of blood collection IMPC_HEM_013_001	1.0	procedureMetadata		Retro-orbital puncture			TEXT
Anticoagulant	1.1	procedureMetadata		K(2)-EDTA			TEXT

	Version	Type	Increment	Option	Derived	Unit	Data Type
IMPC_HEM_014_001							
Samples kept on ice between collection and analysis IMPC_HEM_018_001	1.2	procedureMetadata		No			TEXT
Storage temperature from blood collection till measurement IMPC_HEM_026_001	1.2	procedureMetadata		25		C	TEXT
ID for blood collection SOP IMPC_HEM_020_001	1.1	procedureMetadata		RIKENMPP_003a_003			TEXT
Date and time of blood collection IMPC_HEM_021_001	1.2	procedureMetadata					DATETIME
Blood collection experimenter ID IMPC_HEM_024_001	1.1	procedureMetadata					TEXT
Data and time of sacrifice IMPC_HEM_016_001	1.2	procedureMetadata					DATETIME
Blood analysis experimenter ID IMPC_HEM_017_001	1.0	procedureMetadata					TEXT