SUPPLEMENTAL DATA

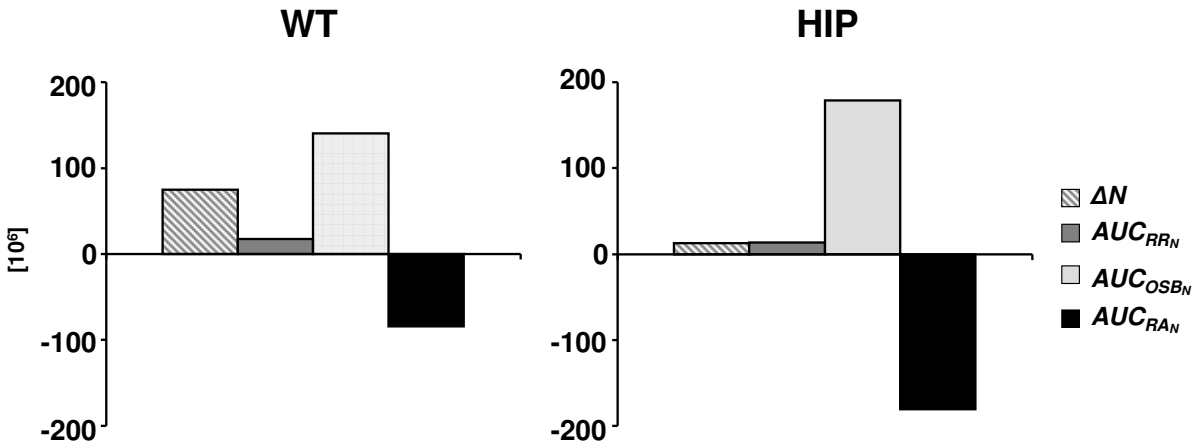

Figure 1 – supplemental data. β-cell number turnover: overall contributions

The balance in β-cell number in WT (left panel) and HIP (right panel) rats, aged 0.07-10 months. Striped grey bars represent the net change in β-cell number (ΔN) from age 0.07 to 10 months. The grey and light-grey bars show, respectively, the overall contributions to β-cell number from replication of existing β-cells (AUC_{RRN}) and from other sources of β-cells (AUC_{OSBN}); the black bars the loss due to β-cell apoptosis (AUC_{RAN}).

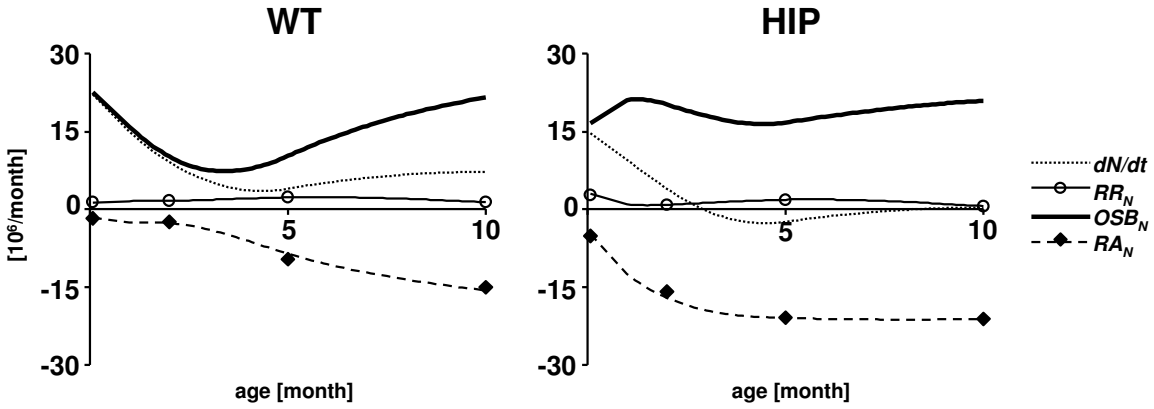

Figure 2 – supplemental data. β-cell number turnover: time-profiles

Time profiles of rate of change in β-cell number *dN/dt* (dashed thin line), rate of β-cell replication referred to number RR_N (data: circles; smoothed profile: continuous thin line), other sources of β-cells OSB_N (continuous line), and rate of β-cell apoptosis referred to number RA_N (data: rhombuses; smoothed profile: dashed line) in WT (left panel) and HIP rats (right panel), aged 0.07-10 months.

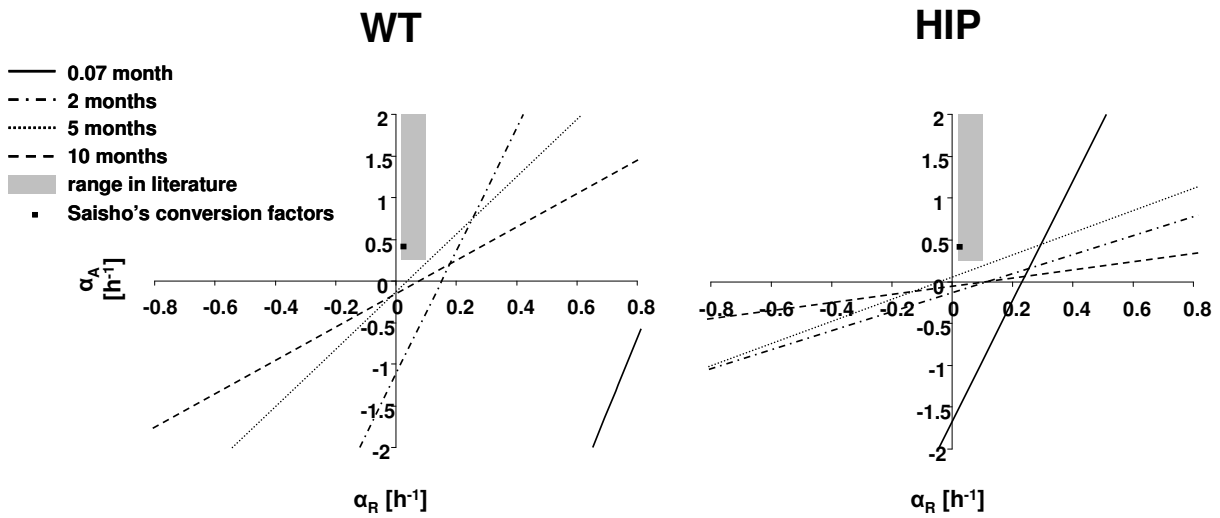

Figure 3 – supplemental data. Conversion factors for β-cell replication and β-cell apoptosis required to conclude that there is no formation of β-cell from sources independent from β-cell replication.

The pairs of values for the conversion factors for β-cell replication α_R and β-cell apoptosis α_A lying on each line represent possible values for α_R and α_A which allow to conclude that OSB is zero. In this figure are depicted those linear relations in WT (left panel) and HIP rats (right panel) for each analyzed age: 0.07 (continuous line), 2 (point-dashed line), 5 (dashed thin line), and 10 months (dashed line). In details, linear relations are obtained from equation 1 (experimental procedures) assuming OSB equal to zero for each time (age) point where the rate of change in β-cell mass, β-cell mass, and frequency of β-cell replication and apoptosis are known.

The required conversion factors that would satisfy the mass balance described by equation 1 (experimental procedures) assuming OSB equal to zero are not in the plausible range (grey rectangle) based on the published literature (1-6): 0.02-0.1 h^{-1} for replication (corresponding to period of 10-50h for replication), 0.25-2 h^{-1} for apoptosis (corresponding to an execution period of apoptosis of 0.5-4h).

Therefore, this analysis suggests that OSB does exist.

The black square represents the conversion factors measured in β-cells and applied in the present turnover model (7).

Table 1 – supplemental data. Differences between β-cell mass and β-cell number turnovers in WT and HIP rats over the period 0.07-10 months

$AUC_{mass\ turnover}$ and $AUC_{number\ turnover}$ represent respectively the overall contributions (from either replication or OSB or apoptosis) to ΔM (net change in β-cell mass) and ΔN (net change in β-cell number). ΔAUC is the percent relative difference between $AUC_{mass\ turnover}$ and $AUC_{number\ turnover}$. The first four columns report the total contributions from replication, other sources of β-cells, and apoptosis to β-cell mass (number) over the period 0.07-10 months in WT and HIP rats. These quantities are expressed as percentage of the net change in β-cell mass (or number) over the same period in order to make possible the comparisons. The last two columns contain the values of this comparison, i.e. percent relative difference.

	$AUC_{mass\ turnover}$ [% of *ΔM*]		**$AUC_{number\ turnover}$** [% of *ΔN*]		**ΔAUC** [%]	
	WT	**HIP**	**WT**	**HIP**	**WT**	**HIP**
replication	22	98	24	110	9	12
OSB	185	1369	189	1467	2	7
apoptosis	-107	-1367	-113	-1477	6	8

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